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D. M. Campbell, Editor A. T. Kinsley, Associate Editor

The Illinois Department of Health has abandoned the use of horse serum for diphtheria toxin-antitoxin. From and after February 20, 1928, only goat serum is used in the preparation of T-A.

Of the 325 men in the United States designated, as full time county health officers, 320 have the degree M. D.; two have the degree D.V.M., and one the degree, Ph. D. Two have no academic degrees. Of the 790 administrative officers in the various state health departments, 598 have M.D. degrees, nine have veterinary degrees and 38 have engineering, nursing, pharmacy or other degrees.

Liver has become a luxury, at least so far as price is concerned. The time was when five cents would buy all the liver necessary for one or two meals for a large family, but in some locations the price now ranges from 30 to 60 cents a pound. This high cost is the result of excessive demands of liver for medicinal purposes and for fish food in fish hatcheries.

Only nine diseases, out of a list of more than 200 that have the capacity of being fatal to mankind, kill more people than automobiles. According to the state health department, automobiles kill more people in Illinois than diphtheria, infantile paralysis, malaria, measles, smallpox, typhoid fever and whooping cough combined.

Vitamin F, discovered by H. M. Evans, is essential for growth and development of sexual maturity. In experiments, it has been found that lettuce and liver contain vitamin F.

That milk is a wholesome and valuable food is to a degree indicated by the fact that physical, mental and moral progress has been more rapid in those countries where milk and other dairy products are consumed in considerable quantities.

The tuberculosis death rate in 1927 was 93.5 per 100,000 population. This is a decrease of 4.8% from the previous minimum death rate from the white plague. It is probably fair to assume that this reduction was in part due to the diminished number of tuberculosis dairy cows in the country and also in part due to publicity incident to bovine tuberculosis eradication.

In Washington's day the average length of life in Europe was less than 30 years. In Lincoln's day, it was 40 years in this country. It is now nearly 60 years. Thus, the average span of human life has been doubled in 150 years. During the middle ages, one of the principal cities of France contained not one person as much as 50 years old, and persons of 40 were referred to in those days as "gray beards."

Thumping, cough, unthriftiness and digestive disturbances in pigs from one to six weeks of age are the usual symptoms of pulmonary ascaridiasis. The lesion typical of this malady is embolic pneumonia. Treatment is of little value. Proper sanitation combined with proper cleansing of the sow prior to farrowing effectually prevents ascaris infection of the pigs.

Actinomycosis is not uncommon in swine. Castration wounds and the mammary glands are the usual locations of actinomycotic invasion in swine. An occasional infection with actinomyces has been observed in the spleen of swine. Such cases are seldom fatal but are of interest to the meat inspector.

The annual testing of flocks for pullorum infection and the elimination of the reactors reduces the percentage of infection to a minimum in two to three years, excepting in those flocks where infected birds are introduced and in some flocks where sanitary conditions are bad.

Single injection prophylactic rabies vaccine for dogs should contain 20% by weight of brain tissue. That is, a 5cc. dose of rabies vaccine should contain one gramme of emulsified brain material.

Abortion disease in cattle and in bitches has occurred at the same time on some farms in the Belgian Congo according to Van Saceghem. Although it was not so reported, the inference is that the *B. abortus* Bang caused the abortion in bitches because their serum gave a positive agglutination reaction to *B. abortus* antigen.—*Trop. Vet. Bul.* 16-1.

Liver flukes mature after gaining entrance to the liver in from 90 to 120 days. There is a difference of opinion as to the method of entry to the liver. Some investigators maintain that the entry is by way of the portal vessels and others are of the opinion that they pass directly from the peritoneal cavity. A 1cc. dose of C. P. carbon tetrachlorid has been found to be an effective preventative.—*Trop. Vet. Bul.* 16-1.

Scour in pigs is usually a sequel of improper diet of the sow or of mammitis. The treatment of pigs affected with scour due to dietary disorders is not usually satisfactory. This form of scour can be prevented by providing the proper diet for the sow.

Copper, according to some investigators, is an essential factor in the diet of man and animals. The role of copper has not been definitely determined. It appears to have a definite influence upon the hemaglobin content of the blood.—*Science.*

The necessity of improving breeding and feeding of beef cattle is forcibly emphasized by the fact that only about 5% of the cattle received in the Union Stock Yards, Chicago, grade prime or choice.

Tetanus in recently castrated pigs is relatively common, particularly if such pigs are permitted access to stagnant ponds and muddy pens. About 50% recovery can be obtained by carefully dissecting away the tissues adjacent to the castration wound and providing sanitary surroundings.

The efficiency of a dairy cow depends upon a normal properly developed udder. The most serious and common condition that occurs to lower the production of the dairy cow is infection of the udder. Various types of bacteria are capable of infecting the udder but streptococci are the most frequent offenders. Streptococci infection can be readily transmitted from cow to cow by hand or machine milking and this way an entire herd may become infected. Some dairy herds have been disposed of because of the ravages of this infection. The disease is difficult to control because of the fact that an occasional cow is a carrier. The most successful treatment consists in increasing the resistance by the use of the bacterins. In badly infected herds a bacterin prepared from cultures isolated from diseased cows in the herd is usually effective.

Minneapolis Will Entertain the A. V. M. A.

THE 1928 Meeting of the American Veterinary Medical Association which will be held in Minneapolis August 7th to 10th inclusive possesses unusually attractive features that make for a large attendance and a profitable meeting.

Minneapolis is easily reached by rail or automobile. It is not far distant from a sizeable veterinary population. It is the commercial capital of an important agricultural district and contains a great agricultural college with one of the best veterinary research departments in existence. The veterinarians of the "Twin Cities" are genuinely desirous of entertaining the members of the A. V. M. A. from other states, proud of their cities' attractions and may be depended upon to make their confreres stay in "The Land of Sky Blue Waters" a delight.

The convention city possesses many attractions both natural and man-made; numerous beautiful lakes within the city-limits, White Bear and a hundred less well-known lakes within a 12-mile radius; a fine boulevard system and magnificent parks; Old Fort Snelling and the majestic "Father of Waters" which is not so majestic there, however, as in its lower reaches; St. Anthony Falls, a real cascade and Minnehaha Falls scarcely less fictitious than Hiawatha, and a climate salubrious and delightful during the summer season which should last throughout the meeting.

Minneapolis has one of the finest park systems in the world. The Park Board has spread smooth sand beaches along the shores of the lakes and has erected thereon fine sanitary bath houses for the accommodation of the crowds who swarm there during the summer. There are 131 parks within the city limits, with an area of 4,722 acres, or one acre of park for every 100 residents. General Pershing, Marshall Foch and other celebrated generals of the World War have pronounced the sweeping Victory Memorial Drive to be the finest memorial ever dedicated to the memory of those who lost their lives in this great conflict. This drive is three miles long, 200 feet wide and is lined with four rows of Cathedral elms each bearing the name of a Hennepin County soldier who lost his life in the service of his country during the World War.

Minneapolis contains a number of public buildings and business blocks which equal in their architectural features those found in any other city in America. Foremost among these is the county courthouse and city hall, which occupies an entire block. It is built of Ortonville granite and is finished in marble. It has a tower 350 feet high in which is a set of chimes, said to be one of the finest in the United States. Among other buildings worthy of mention are the Federal Building, covering a city block; the Minneapolis Art Museum; the Public Library, containing 463,078 volumes; and the magnificent new $3,000,000 auditorium, one of the finest convention and exposition halls in the world.

For the wives and daughters attending the convention, the local committee reception and entertainment, have arranged the following from other attractions:

A trip through Washburn-Crosby (Gold Medal) flour mills with luncheon at the mills.

A sight-seeing trip and luncheon at beautiful Lake Minnetonka.

A theatre party at the "Minnesota."

An excursion through St. Paul and then to University Farm, and a picnic luncheon with the veterinarians at the clinic.

The program of the meeting will include:

1. Vulvovaginitis in Hogs by S. H. McNutt, Ames, Iowa.
2. A study of the Simultaneous and Serum-Alone Methods in the Treatment of Cholera-Infected Hogs by C. N. McBryde, Ames, Iowa.

3. Some Common Diseases of Sheep by W. L. Boyd, St. Paul, Minn.
4. Prevention and Control of Sheep Parasites in Pennsylvania Flocks by Henry W. Turner, Harrisburg, Pa.
5. Diseases of Range Sheep by E. T. Baker, Moscow, Idaho.
6. Foreign-body Cases in Bovines by E. E. Wegner, Pullman, Wash.
7. Returning the Uterus by E. E. Bittles, Waterford, Pa.
8. Poultry Problems in General Practice with Special Reference to Coccidiosis by John Patterson, Hedrick, Iowa.
9. Breeding Diseases of the Horse by W. W. Dimock, Lexington, Ky.
10. Anaplasmosis in Cattle by Geo. W. Stiles, Denver, Colo.
11. The Practical Handling of Anthrax Outbreaks in Badly Infected Territory by O. M. Norton, Greenville, Miss.
12. Sensitivity, Infectivity, and Intertransmissibility of Tuberculosis by A. F. Schalk, Fargo, N. D.
13. The Practical Relation of Autopsy Findings to Field Work in Tuberculosis Control by J. A. Barger, Des Moines, Iowa.
14. The Present Status of Infectious Abortion Control from a Laboratory Standpoint by Ward Giltner, East Lansing, Mich.
15. Results from the Use of Huddleson's Vaccine for Bang's Disease by Ward Giltner and I. F. Huddleson, East Lansing, Mich.
16. Johnin versus Avian Tuberculine as a Diagnostic Agent for Paratuberculosis of Cattle by W. A. Hagan, Ithaca, N. Y.
17. Regulatory Work with Bacillary White Diarrhea by B. T. Simms, Corvallis, Ore.
18. Some Obscure Diseases of Sheep by Hadleigh Marsh, Helena, Mont.
19. Rabies Control in Indiana by F. H. Brown, Indianapolis, Ind.
20. Rabies Control in Michigan by B. J. Killham, Lansing, Mich.
21. The Only Source of Supply of the Profession by David S. White, Columbus, Ohio.
22. The Essentials in Veterinary Education by Geo. H. Glover, Fort Collins, Colo.
23. Undulant Fever in the United States by C. M. Carpenter, Ithaca, N. Y.
24. The Influence of Dietary Deficiences on the Resistance to Disease by Solon N. Blackberg, New Orleans, La.
25. The Pathology of Sweet Clover Disease in Cattle by Lee M. Roderick, Fargo, N. D.
26. The Effects of Trichostrongylus Axei in the Stomach of the Horse by E. W. Price, Washington, D. C.
27. Hemorrhagic Septicemia in Swine by M. F. Barnes and A. L. Brueckner, Harrisburg, Pa.
28. Further Studies on Enteritis in Swine by Chas. Murray, H. E. Biester, S. H. McNutt and Paul Purwin, Ames, Iowa.
29. Studies on Hog Cholera by H. C. H. Kernkamp, St. Paul, Minn.
30. Fowl Cholera Studies by F. R. Beaudette, New Brunswick, N. J.
31. The Immunizing Value of Atoxic Botulism Toxin (Botulism Toxoid Botulism Anatoxin) by Robert Graham, E. C. McCulloh, Urbana, Ill., and E. A. Tunnicliff, Sonora, Texas.
32. Ultraviolet Light in Small Animal Practice by J. C. Flynn, Kansas City, Mo.
33. Open Reduction of Fractured Bones of Dogs by E. L. Quitman, Chicago, Ill.
34. Hookworm Infestation by S. W. Haigler, St. Louis, Mo.
35. Anatomy of the Dog (Illustrated) by J. D. Grossman, Columbus, Ohio.
36. Emergencies Following Automobile Injuries to Small Animals by H. W. Brown, Fort Wayne, Ind.
37. Some of the Rarer and More Neglected Parasites of Dogs and Cats by E. W. Price, Washington, D. C.
38. The Hospitalization of Small Animals by J. Elliott, Long Island, N. Y.
39. Observations on Canine Distemper by F. W. Wood, Berkeley, Calif.
40. Results of Research on the Diseases of Fur Animals in Captivity (Illustrated) by R. G. Green, J. E. Schillinger, Minneapolis, Minn.
41. Fecal Examinations for Evidence of Parasitism in Domestic Animals (Illustrated) by E. A. Benbrook, Ames, Iowa.
42. The Danger to Man of Bovine and Avian Tuberculosis by Chas. H. Mayo, Rochester, Minn.
43. Research on Bacillus Calmette-Guerin (B. C. G.) by E. A. Watson, Ottawa, Canada.

An unusual convention in an interesting city. No member of the association who can go to Minneapolis in August will want to miss it. This should be the largest convention in the history of the association. Arrangements have been completed for the operation of special sleeping cars from Kansas City, Omaha and Chicago, over the Chicago Great Western Railroad on the following schedule:

From Chicago, 6:30 p. m., August 6.
From Kansas City, 5 p. m., August 6.
From Omaha, 8:30 p. m., August 6.
Arrive Minneapolis, 7:50 a. m., August 7.

Pullman reservations may be made by wire or letter addressed to the Chicago Great Western Railroad in Chicago, Omaha or Kansas City.

For those going over the Great Western from Chicago, a stop over at Rochester, either on the going trip or returning, can be arranged without extra cost, and thus a visit to the world-famous Mayo institutions in that city.

Bacillary White Diarrhea*

By B. A. BEACH, Madison, Wisconsin

BETWEEN the years 1900 and 1909 Dr. L. F. Rettger of Yale, and Rettger and Harvey established beyond question the identity of white diarrhea or pullorum infection. They associated the disease with young chicks, and isolated and successfully grew the specific organism. About 1913 Dr. F. S. Jones of the Rockefeller Institute developed the agglutination test. It has been used with a greater or less degree of success ever since.

White diarrhea is a fatal disease of chicks; but some debilitating influence is usually necessary before the chicks are susceptible. It is possible to raise young chicks from infected stock and raise them successfully. I do not say it is always possible, but many times it is.

We have an experiment in Wisconsin with a large number of hens. The reactors in the experiment are purposely left in. The brooding mortality has never been higher than ten per cent. Hardly anyone under commercial conditions, with us can do better than that. These chicks are kept under especially fine conditions. We know then, that for a number of years it has been possible to so rear chicks from infected stock. Were we to subject these chicks to railroad journeys, or to the brood conditions that obtain on a good many farms, we might get quite a different picture as far as the mortality is concerned.

It is evident that a debilitating influence is often necessary to light up this infection. Understand, we are assuming that the infection is there. Hatcherymen will sell to possibly eight or ten farmers from the same hatch. On one or two farms the chicks will die very rapidly from typical white diarrhea. Six or eight farmers will be successful in rearing their chicks. If pullorum infection was the primary cause of the trouble, the losses should be evenly distributed.

White diarrhea is a disease principally of young chicks, the first few days of life. They linger on, of course, for a matter of two or three weeks before they are all dead or all dead that are going to die. It is occasionally seen in chicks after they reach broiler age. The infection may be present in poultry yards. It is possible for chicks to be hatched free from the disease and still succumb. Soiled brooders and poultry yards may be the source of the infection. I don't know how frequently this is true, but I know we have found the organism in poultry yards.

We are coming more and more, in Wisconsin at least, to find this infection in adult birds. We have a peritonitis that is apparently caused by this organism. I say apparently for this reason. The hens will die exhibiting typical peritonitis and the *B. pullorum* is the only organism that we can find. We have records of some flocks where a large number of the adult birds have died. Here again possibly some debilitating influence is necessary.

You are probably all familiar with the picture that you see when you open a hen whose ovaries are badly infected with this disease. Usually such hens are not as profitable as those with normal ovaries. We have been surprised at times to find hens with badly diseased ovaries lay for a time just about as well as any hen. We believe that the infection is serious in adult birds at times. The *B. pullorum* is an organism that is apt to be present, and if present, is many times the cause of more or less serious trouble.

Our knowledge of this disease is not complete; it is not nearly as complete as we wish it were. We have tested quite a large number of pullets raised from infected or at least from reacting hens. The pullets from those hens as a rule will not react. I don't know what the experience is here in Iowa,

* Notes from an address at the Annual Meeting of the Iowa Veterinary Medical Association, Des Moines, Jan. 17-20, 1928.

but that's our experience in Wisconsin. The pullets, until they reach laying age, will not react. After that time many of them will react, not all at once, but as they start to lay. If you test them every month or twice a month, you will find an increasingly large number of them become reactors. If the infection lies dormant in the meantime, where is its seat? It has been thought that the ovary of the pullet is the seat of this infection; but we have failed to find the infection in the ovaries of these young pullets. It may be there at times, but we haven't been successful in finding it.

In a small number of non-reacting hens and pullets, in approximately 25% of them, we did find the organism of white diarrhea in the digestive tract. The number with which we worked is so small that we cannot draw definite conclusions. We don't know in what percentage of birds, reacting and otherwise, the organism is found in the digestive tract. That is something that should be, and doubtless will be, investigated.

We received a letter from a woman in which she said that her white leghorns were laying boiled eggs. That was a new one on us; we had never heard of a hen laying boiled eggs. I thought it was some crazy idea she had, and what I said in my letter didn't satisfy her, and she offered to send down some of those hens so that we could see for ourselves, and she did send six.

The hens had red combs, were in good flesh, apparently in good condition; but they didn't lay. We killed them and found a very severe inflammation of the oviducts in all the six hens. Some of the oviducts were completely filled with more or less dried egg yolk from which we isolated white diarrhea infection in pure culture. I wrote the owner and asked her if she had ever had white diarrhea in her flock, she replied she had not. Whether that is true or not, I don't know, but certainly she had not lost a large number of chicks.

The history of this flock was that the pullets laid well during the winter. In the latter part of May the production decreased until they were laying less than 10% by the middle of June. Whether all the hens in this flock had this inflammation of the oviduct, I don't know, but they largely stopped laying, and many of the eggs they did lay were abnormal. The owner sent some of the eggs to the laboratory and they actually looked much like they had been boiled. As near as we could determine there had been some gross mismanagement in the feeding of this flock which possibly so lowered the resistance of these hens that the infection in the generative tract flared up. That is just a theory, but we recently had one other flock with the same history. They may be the only two such flocks in the United States, but probably they are not.

That infections pass through the intestinal wall at times and cause trouble, there is no question. We have had abortion in cattle, in a large number of the pregnant females in herds, due to colon organisms, always following some feeding or other upset.

Along about 1922 the agitation on the subject of white diarrhea got pretty strong. We knew we had some of it in the state but, we didn't know we had any in our Station flocks. We found, however, about 11% of our hens to be infected as shown by the test. Many of these were pedigreed, and in going over the records with the poultrymen after our testing was complete, the results were surprising to us. There did not seem to be much correlation between the reaction and breeding efficiency of a hen. Mind you, I do not say the infection—I say the *reaction* and the breeding efficiency of the hen. That led us to take a bunch of hens, Rhode Island reds, and barred rocks, and a few white Leghorns, and test them twelve times in thirteen months. The results were interesting. Maybe the hens would react one month and then cease to react. There was very little constancy. A good many could be called either positive or negative depending on the month selected for the test. At first we thought that the infection didn't amount to much because we believed that a reaction meant infection and vice versa. We have since found that such is not the case. The California experiment station did the same thing on a more comprehensive scale. One of their station veterinarians tested two hundred birds. Seventy of these birds reacted.

He tested these seventy birds every month for a year. The first year's work was reported in April this last year. Starting in December with those seventy reacting hens, he tested them in January and clear around until the following November. The most of those hens that reacted in any one month after the first test was seventy-three per cent. The lowest number was thirty-eight per cent, which means that had he tested them at that time and no other time, a large percentage of those birds would have been considered free. During the twelve months 20 of them died. Nineteen were carefully posted and cultured. A surprising thing was that approximately fifty per cent of the 20 that died failed to react at the last test before the postmortem examination was made. Some of them had failed to react for four and five months before the autopsy.

A comparison of eggs and chicks from non-infected and infected, non-reacting and reacting hens was recently made, at the Wisconsin Experiment Station. These hens were tested at frequent intervals. Then after the eggs were saved and the chicks hatched and brooded, we killed the hens and our basis of infected and non-infected hens was determined by the postmortem and cultural findings. Table I shows the result. The non-infected and non-reacting hens made a somewhat better showing than the infected and reacting hens, except for the livability of the chicks which was best from the reacting hens, practically offsetting the advantage in hatchability from the non-reacting hens.

Table II shows the serologic and cultural tests on non-reacting hens. This work is the most surprising piece of research work we have ever done. We had a pen of 29 hens that were non-reactors. As shown by the chart these were negative in January, February, March and May. The final bleeding was done between the latter part of May and August when the hens were killed. With the exception of four, none reacted. The four that reacted on final bleeding, were included because they had been with the others and were negative up through the May test until the final bleeding. Thirteen showed lesions that you could see with the naked eye, and seven laid infected eggs. Note hen No. 10. She was an interesting

Identification	Eggs incubated	Chicks hatched	Per cent hatchability	Chicks died 1st 4 weeks	Per cent livability
Non-infected hens...	466	355	76.2	92	74.1
Infected hens.....	1141	685	60.0	181	73.6
Non-reacting hens...	714	506	70.8	146	71.2
Reacting hens.....	804	512	63.6	119	76.8

Table I—Comparison of Eggs and Chicks from Non-infected and Infected Hens and from Non-reacting and Reacting Hens.

one. Along about the latter part of April she laid an infected egg and between that time and the time that she was killed or the time we quit culturing eggs from her, about June first, she laid three infected eggs. We never could get her to react. Yet when killed she had badly diseased ovaries, and the cultural results were positive.

We made some investigation of the com-

Table II—Results of Serologic and Cultural Tests on Non-reacting Hens.

Hen No.	Agglutination Reaction					Microscopic ovarian Lesions	Results of ovary culture	Pullorum found in eggs
	Jan.	Feb.	Mar.	May	Final*			
4	0	0	0	0	0	+	+	+
8	0	0	0		0	0	+	0
9	0	0	0	0	0	0	+	0
10	0	0	0	0	0	+	+	+
12	0	0	0	0	0	+	+	0
14	0	0	0	0	0	0	+	0
20	0	0	0	0	0	0	+	0
22	0	0	0	0	0	+	+	+
32	0	0	0			+	+	0
36	0	0	0	0	0	+	+	+
40	0	0	0	0	0	0	+	0
52	0	0	0	0	0	+	+	+
53	0	0	0	0		+	+	+
57	0	0	0	0	0	+	+	0
71	0	0	0	0	0	0	+	0
74	0	0	0	0	0	0	+	+
75	0	0	0	0	0	+	+	0
3	0	0	0	0	+	+	+	0
6	0	0	0	0	+	+	+	0
13	0	0	0	0	+	—	+	0
17	0	0	0	0	+	0	0	0
18	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0
37	0	0	0			0	0	0
38	0	0	0	0		0	0	0
42	0	0	0	0	0	0	0	0
51	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0	0

parative value of agglutination and pullorin tests. A flock of 38 hens were used in this experiment. They were tested with two kinds of pullorin, one the ordinary kind and

*Final bleeding at time of slaughter, i. e., between July 1, and September 1, 1927.

the other a filtrate. This pullorin was furnished by the Ohio state laboratory at Reynoldsburg. We injected one product in one wattle and the other in the other, and

Table III—Agglutination and Pullorin Tests and the Presence of Salmonella Pullora in the Ovaries.

Hen No.	Agglutination Reaction	Pullorin Filtrate	Cellular Pullorin	Presence of degenerated ova	Pullorum present in ovary
25	+	+	+	+	+
73	0	0	+	0	0
43	+	+	+	0	+
24	+	0	0	+	0
P386	+	+	+	+	+
P352	0	0	+	+	0
61	0	0	+	+	0
90	+	0	0	+	0
P357	0	0	+	+	0
40	0	0	+	0	0
P358	0	0	+	0	0
3	+	+	+	+	+
4	0	+	+	+	+
6	+	0	0	+	+
9	0	+	0	0	+
10	0	0	0	+	+
14	0	0	0	0	+
20	0	+	0	+	+
21	0	0	+	+	+
22	0	0	0	+	+
52	0	0	0	+	+
57	0	0	0	+	+
75	0	+	0	+	+
87	+	0	0	+	+
88	+	0	0	0	+
P7	+	0	0	+	+
P72	+	0	0	+	+
P76	+	0	+	+	+
P77	+	0	0	+	+
P201	+	0	0	+	+
P356	+	0	0	+	+
P379	0	0	0	+	+
P390	+	0	0	+	+
P391	+	0	0	+	+
P393	+	0	0	+	+
P397	0	0	0	+	+
P398	+	+	+	+	+
P399	+	0	0	+	+

the results are very confusing. We also at this time made the agglutination test. Of the 38 hens tested with the agglutination and pullorin tests seven, or 18.4% were infected but failed to react to any test. 11 or 25.2%, were infected and failed to react to the agglutination test. Nineteen, or 50%, were infected but failed to react to either pullorin test. One kind of pullorin was just about as effective as the other with the exception, that in the pullorin filtrate we got no false reactions. With the other we got six false reactions. Twenty-two, or 57.8%, of the infected failed to react to the pullorin filtrate and the same number, or 57.8 per cent, failed to react to the cellular pullorin.

The conclusion seems obvious that we do not as yet have sufficient information upon which to undertake, officially, the eradication or even the control of white diarrhea.

A WONDERFUL MACHINE

While in charge of the Department of Animal Industry for the Republic of Cuba, we had several stallions and a jack, the services of these animals for breeding purposes being free. As mares were bred throughout the year there, it was the rule to breed these stallions but once daily. If a number of mares were coming in, W. W. Dimock, my assistant, would collect some semen and place it in an incubator for use in artificial insemination. One day a Cuban countryman ("Guajiro") rode his mare in and wanted to breed her to the jack. The jack, however, had been used an hour previously and semen collected. As the mare was in heat the owner started to take the saddle off. Doctor Dimock told him that was unnecessary and this puzzled the Cuban. Doctor Dimock then took a nickel impregnating syringe and injected the semen into the mare's uterus and told the Cuban the mare had been bred. The Cuban said, "I'm a countryman all right but I haven't got long hair," (meaning he was not a wild Indian with long hair). As Doctor Dimock could not convince him, he sent him in to my office. He was much embarrassed and said, "The boys at the stable are fooling me. They stuck a machine into my mare and said she was going to have a colt." I tried to explain the situation and pacified him somewhat and he said, "You Americans have great inventions—I know that—but I'll never believe this until my mare has a mule colt." I told him to watch his mare to see if she came in heat again. A year later he came riding in with a fine mule colt ambling along beside his mare. The Cuban was very proud of the colt and asked if he wanted to breed his mare to the jack again, answered, "Not much, I just want that American machine."

N. S. Mayo.

Abbott Laboratories,
No. Chicago, Ill.

Pigs*

By A. T. KINSLEY, Kansas City, Missouri

AGRICULTURE in Missouri is largely dependent upon the swine industry. Pigs can be economically produced in the Ozark section of the state, shipped to the corn belt of the state and finished there. It would probably be more economical for the corn farmer to raise the pigs than it is to buy them if the enormous loss of baby pigs could be prevented under farm conditions. Although many animal scourges have threatened the live stock industry of this country the veterinary profession has in every instance rallied to the call, and the live stock industry has survived. It has been demonstrated that it is possible to diminish infant pig mortality to a minimum by proper care and management. It remains only to carry out what is now known to avoid the devasting losses that is the usual experience in pig production.

The production of pigs with a minimum loss is dependent upon providing conditions that at least aproximate those of the pig's wild ancestor. Let us look into the surroundings and habits of this wild ancestor in his native haunts. The wild hog sallies forth at daybreak in search of its daily ration. It picks up a nut here, a wisp of grass there, then turns over a stone in search for grubs. This hog travels on, drinking some sparkling clear spring water or clear running water from a stream; such animals drink stagnant water only when clean fresh water is not available. If food is plentiful the wild hog may rest for an hour or more in some shady secluded spot where it can defend itself or readily escape should it be attacked by enemies. Soon this wanderer is on the way seeking more food and water. The hog is omnivorous, that is its ration in nature contains both animal and vegetable matter, thus the wild hog consumes nuts, fruit, grass, roots, grubs, the young of other animals and minerals, thus balancing its ration. It should be further noted that the wild hog consumes bulky foods. When the day is done, the wild hog seeks a clean dry place and beds for the night after having traveled from 3 to 10 or 12 miles during the day, the distance depending upon the scarcity or the abundance of feed.

Thus, the wild hog has an abundance of exercise in obtaining his daily ration and in self protection. Day in and day out the wild hog follows a similar routine and becomes mature at 2 to 3 years of age. He leads a lonely life, in the main an isolated existence; he seldom sees others of his kind or feeds or sleeps on ground recently contaminated by other hogs.

When the wild gilt is 12 to 15 months of age she seeks a boar and mates. The mating of wild animals is not a prolonged affair as the wild animals are in continual danger of attack and must always be ready for combat or flight. Not infrequently the breeding consists of a single service. Most wild animals, and swine in particular, are positive breeders, sterility being rare. The bred gilt goes her way with the usual routine of getting her daily ration until a day or two prior to farrowing, when she finds a dry, well-drained, protected, secluded spot close to water, and makes her nest. She has no farrowing difficulties, the pigs are born and the mother remains in her nest with the recently farrowed pigs for 24 to 48 hours, excepting for a few moments, during which time she goes to the nearby water supply for a drink. She does not leave the pigs in search of food until the third or fourth day after farrowing, and then

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for only a very short time. Thus, she continues safeguarding her litter until they can range with her.

This is the routine of the wild hog in its native haunts, going through the cycle of life. One thing perhaps should have been added: The wild pig suckles its mother for about three or possibly four months, but the dam being a wild animal does not receive excess feed and therefore does not give a large quantity nor a high quality milk.

Compare our modern pig. Compare the type of our present-day hog with the original wild hog. We have reduced the thoracic cavity, and have diminished the volume of the digestive organs in our native hog through selection and breeding. This has been accomplished at the expense of vigor, hardihood and resistance to disease. Our native hog, for economic reasons is selected and fed to market at an age of not to exceed eight months, and some of them at six months. The wild hog matures at about two and one-half years of age.

Note, if you will, the breeding problems that we have to contend with in our native hogs. Compare these problems to those of the wild hog. There is one or two services, no more in the wild hog. Why? Because both the gilt and the boar are alert and on their guard, for they must be ready for an attack at any time, so there is no frequency of service.

How about feeding? The wild hog perforce balances his ration, because of the scarcity of any one kind of feed. Until very recent years, the domesticated hog was fed corn and water, the feeders having apparently forgotten that the wild hog is omnivorous, that they require not only the concentrated grains, but also some bulky food and some animal matter. At the present time those conditions have been corrected to a large extent by providing tankage and other like products.

With this picture of the wild hog in mind, comparisons can be made with care and management of swine on the American farms today. In the United States swine represent about one-tenth of the agricultural assets. Swine like other animals and commodities vary in number produced, depending upon the demands for the products. According to the census, in 1867, there were approximately twenty-four and a half million swine in the United States, valued at approximately one hundred million dollars.

In 1919, swine production reached the peak, and there was approximately 74,500,000 swine produced in the United States with a value of one billion six hundred forty million dollars. These facts evidence the growth of the swine industry and its importance.

Pig Production

Are you aware of the fact that in United States there are maintained approximately seven and one-half million brood sows, to produce the average of sixty million swine demanded today? You will readily see that each brood sow in the United States produces on an average of eight pigs, annually. The average sow on the American farm produces two litters yearly. The average litter production is nine pigs plus. From this it is evident that less than one-half of the pigs actually farrowed reach the age of maturity. Of 18 pigs produced, only 8 survive to marketable age.

Why discuss this? You say, "We are not the breeders." No, you are the advisers of the breeders, however, and if you can increase breeding efficiency from fifty to seventy per cent, then you will help swine producers throughout the United States to diminish the number of brood sows from seven and a half million to five million, which for the swine producer means a net saving of over a hundred million dollars annually. Is it worthwhile? It is one of the important problems that confront us.

What are the causes of this excessive infant pig mortality? These causes may be summarized in five different groups: First, errors in breeding. Drop back now, and look at the wild hog in the forest. Compare Nature's method of breeding with those that we use. Per-

haps we can gain something that will be of value. Note the age. Some swine producers begin the service of a boar at six months of age. A young, immature boar tends to produce pigs of relatively lower vitality than the produce of a mature boar. Certain, we must now and then introduce a young boar, but occasion should be such that the animal is not put into service extensively until he is ten months, and preferably one year of age.

Relative to the frequency of service? I remember visiting one swine producer's farm on which his pig production was very low. It was found that his boar was in a lot with some twelve or fifteen sows. The particular day that I visited this farm there were three or four sows in season. During two or three hours in the afternoon, while observing this little lot of hogs, this one boar made fifteen services. Can you predict what the vitality of those pigs would be? I suspect you can. The average pig production of live pigs, of pigs that were sufficiently virile to live were three per sow. Although each sow produced eight or nine, some were dead, and others were weaklings and died during the first twenty-four hours. In other words, increase the efficiency of breeding by the use of common sense and good judgment, eliminate so-called pasture breeding, and pig production will be increased.

Perhaps you have your breeders educated so that they now produce pigs by individual, single service. The boar should be kept in his quarters. When a sow is to be bred, she should be taken to the boar's quarters, given one service and removed, if virile pigs are to be produced. This procedure will help to diminish the appalling infant mortality of pigs.

One other thing I should have spoken of in relation to frequency of service. No doubt some of you men are, during the breeding season occasionally called onto farms where pasture breeding with the boar is practiced, to treat such animals for orchitis. Excessive service is prone to result in orchitis, and more or less permanent sterility. Frequently a breeder will lose an entire pig crop because of either temporary or permanent sterility of his boar that has been brought about by errors in breeding.

Second, all breeding animals should be normal. Occasionally we find a splendid individual boar that is a cryptorchid. I recall one cryptorchid owned by a breeder at Liberty, Missouri, a splendid individual, so good that the owner did not believe he could afford to sacrifice the animal. This boar was used quite extensively as a breeding boar throughout that community and approximately five per cent of his male pigs were cryptorchids. This defect went down to the second and third generations. The breeding of defective animals is a disadvantage. The use of a cryptorchid sire does not diminish the number of pigs, but it is expensive to have several cryptorchids.

When sows or boars either are diseased, particularly infected with any disease of the genital organs, they should not be bred. This condition can readily be determined and is usually known by the breeder. Discharges from the female genital organs invariably indicate some type of infection. Such animals should be eliminated from breeding service. In other words, those individuals that are not going to be good producers should be removed if swine are produced most economically.

The second cause for infant pig mortality and one that also obtains very largely in calves, is feeding. Feeding is of as much and perhaps greater importance as a factor in pig losses than are the breeding problems.

Go back again to the woods. What does the wild sow do two or three days before farrowing? She does not eat much; she prepares her nest at a clean, dry place, a vantage point so that she can protect her young. What does she do for two or three days after farrowing? She obtains very little food, watches those pigs, and does not obtain much food for ten days after farrowing because she is in constant watch over her young.

What about your native sow when she farrows? Gentlemen, if you can induce the breeders to diminish the feed to a minimum two or three days prior to farrowing, remove all feed for twenty-four hours after farrowing, then give just a little slop feed for two or three days, and gradually increase the solid feed of that sow so that she is on full feed not earlier than the tenth day, you will diminish the losses from pig scour ninety per cent.

Do not misunderstand, it is conceded that infection is a factor in pig scour but the feed of the sow is the important contributing factor to indigestion in the pig, thus paving the way for the infection that is ever present and permitting the infection to establish itself and bring about the inevitable loss from scour.

Why these losses from scour? The wild hog in the woods gives a relatively small quantity of milk, and not of high quality either. The scarcity of food in that wild sow is, after all, Nature's method of insuring the survival of wild pigs. Or to put it another way it was only those individuals that could survive under such conditions that lived to procreate, and our domesticated hog is the descendant of countless thousands of generations of such survivors. It is well to go back to Nature occasionally and observe how things are done and apply the knowledge so obtained to present-day problems.

The good breeder selects certain brood sows not only because of type, character, and certain peculiarities, but also because of the fact that they are good milk producers. There are sows now that are high milk producers, producing probably ten times as much milk as the original wild hog.

The third factor in the loss of little pigs is improper housing. That wonderfully constructed concrete, permanent hog house is one of the factors that has been responsible for diminishing pig production, not the hog house in itself, but because of the fact that it is not properly ventilated, perhaps has a concrete floor, and is, therefore, not conducive to healthfulness, particularly in the recently farrowed pig.

The fourth factor in excessive pig losses is insanitary surroundings. See your wild hog back there in that nice, clean nest, perhaps there has been no other hog bedded there for ages. What about our modern hogs? We have them in mud wallows, in filthy lots that some farmers say are good enough for swine, but gentlemen, swine are animals that in the native state select clean, dry quarters, and can we hope to have those animals accustom themselves to insanitary conditions without injurious results? Insanitary surroundings are responsible for excessive losses due to parasitism, due to infections, like bull-nose, stomatitis, and a variety of other fifth-borne diseases that are continually helping decimate domestic animals.

The fifth factor perhaps is not in itself a separate entity, but goes hand in hand, with the other factors that have been mentioned, namely, diseases. First, I would mention metritis. We have already mentioned this indirectly as an error in breeding. A swine producer will ask you — it is a common question — "Doctor, what is the cause of the runt? This sow always has one or two runts. I always have a few runts on my farm."

How do you answer him? It is presumed that you are familiar with the fact that the uterus of the sow is prone to infection, starting usually in one end of the horn, the rate of the extension of infection, depending upon the virulency of that infection, there may be one-half of the pigs actually destroyed in utero—their life sacrificed before farrowing—or there may be none of them destroyed, but the first one or two, next to the seat of the infection, will show diminished virility; perhaps they may be smaller and may begin scouring within twenty-four hours and die.

You have all seen that picture, and mind you, runts are usually due to an infected uterus. If the infection is sufficiently virulent to destroy all the pigs in utero, then abortion may occur, but

frequently that infection is of a low type virulency; and as stated, there may be a dead pig, the size of a mouse; the next one may have reached twice the dimensions of the first and be destroyed; the next may be under size and live; hence the runt.

A second infection that destroys a larger number of pigs, more some years than others, more in some localities than others, is abortion. Pigs may be born alive, very weak, and die within two or three days. In taking the census of pig losses in a community or a state, aborted pigs are not counted, but they have been produced and they should be considered in the general census of numbers of pigs produced in the community.

A third disease that affects pig production is "swine flu." In this section of the country if sows are bred and a month or six weeks thereafter become affected with so-called swine flu, the percentage of live pigs produced is likely to vary from not more than ten up to forty per cent. In other words, an attack of flu is a very destructive influence to pigs carried in utero. Why, I do not know. It is just an observation of a condition that actually exists. I think it was two years ago there was a section in a neighboring state in which the pig crop was not more than twenty per cent normal because of the losses at farrowing time or immediately thereafter, due to an attack of flu during the period of pregnancy of the sows.

So much then for the factors that are an influence in losses of pigs. To repeat, they are, first, errors in breeding; second, errors in feeding; third, improper housing; fourth, insanitary surroundings; fifth, various microbic infections.

In addition to the pig losses incident to improper management there are some diseases of pigs that are responsible for further losses. There are many diseases that contribute to the fifty per cent loss that has been mentioned. Those that may be most important in Minnesota are perhaps not as important in Indiana; likewise, those that are an important factor in Iowa may not apply here. Pig maladies may be grouped to conserve time in their discussion.

First, two deficiency conditions, goiter and rickets, may be mentioned. You know the cause of both of them. Our soils are beginning to become deficient in phosphorus; at least if grains and provender produced on these soils are prone to produce rickets in chickens, then we would presume that perhaps they would be prone to produce rickets in pigs. Phosphorous is an important element in nutrition. Rickets is going to become more and more important, year after year, because our soils are becoming more and more depleted, unless our farmers are adding phosphate fertilizers.

Goitre is a disease due to deficiency of iodin in the soil and feed.

Scour in pigs. Roughly, it may be stated safely that the losses in pigs in the United States from scour alone approximates ten million annually. Think of it! Nearly one-half of the swine production in 1867, we now sacrifice annually because of scour, and primarily because of improper feeding of the sow just before and after farrowing.

Ascaridiasis, or infestation by the ordinary parasitic round worm is also responsible for the loss of ten millions of pigs annually in the United States. A loss that could be prevented by observing proper sanitary precautions in swine production. Twenty million pigs have been accounted for. The average production is sixty million a year. One-third of the average production are thus destroyed by two preventable diseases.

Other diseases that are a factor in pig losses are pyemic arthritis, bull-nose, stomatitis, polyarthritis, and possibly anemia. I am not certain that pig anemia exists in our country, perhaps it does.

Aside from those diseases mentioned you understand that little pigs can become affected with cholera, hemorrhagic septicemia, swine erysipelas or even be struck by lightning.

The Importance of Regular Attention to Accounts

IN SPITE of every precaution accounts are bound to pile up on the books unless they are regularly followed up with statements and other reminders. Business houses recognize this fact and keep after their accounts in a routine fashion without fear of losing their trade by, asking for their money when it is due. Many successful veterinarians handle their practice accounts on a similar business basis adopting the practices of business houses, in the handling of accounts.

The statement soonest received is soonest paid. The first of the month is the generally accepted time for sending statements. Progressive houses mail their statements a few days before the first so that the statement will be on hand bright and early in the game.

One successful practitioner has said that he got better results by mailing his statements on the fifteenth instead of the first, because, "then my statement does not compete with the butcher's, the baker's, the rent, and the whole host of other bills which the average man receives on the first of the month."

If the first statement does not bring in the money it should be followed up within thirty days at the longest, with a written reminder or personal visit. The personal visit is of course more effective, although because of the time required for personal calls, many prefer to write and take a chance of waiting longer for their money.

The Foundation of the System

Haphazard methods in making collections by mail are usually unproductive. A definite policy should be adopted to rule the spirit and wording of all "duns."

The policy which works out best in the long run is "Continued, consistent courtesy, under every provocation."

This does not mean that one is never to come to the parting of the ways with a debtor, but that when the time does come the debtor is to be impressed with the absolute fairness of treatment which he has been accorded and that no matter what action may be taken there is no personal rancor.

Avoid the use of such terms as "dead-beat," "no good," etc. Remember that the man who is down today, may be on the top tomorrow, and treat him as if he were on the top today. It is this policy that collects even after five or ten years and makes a good friend and customer out of the erstwhile "dead-beat," though the account may have been in the hands of a dozen collectors in the meantime.

A fixed routine for the handling of accounts should be adopted and consistently followed. There is no necessity for the special machinery such as is used by the credit man of a large business.

Undoubtedly every veterinarian has a ledger devoting a single card or ledger page to each patron's account. On the margins of these accounts pencil notations can be made which will cover all statements, reminders, etc., sent on that account. When the account is closed these can be erased or left as reference for the "next time."

We will assume that the first statement is sent in March. The date 3/1/16 is noted, followed by the figure "1." Later will appear 4/1/16-2, etc. Promises to pay, etc., may also be noted in this way and used as a basis for future follow-up.

Duns may be in the form of simple written notations on the statement, various "forms" attached to or accompanying it, or personal letters. The use of

written notations is being generally substituted by printed stickers or rubber stamps, their value being in the time they save and in their more attractive appearance.

Collecting by letter is really a form of advertising; you "sell" a man the desire to pay your bill, and as in all advertising the unusual, the personal equation, the "you and I" element is what attracts attention and gets action.

What to Say

Give your man a chance. He may have overlooked your first statement (although he probably didn't), or he may have paid the butcher bill and had none left. So try to get under his skin with something like this: in your second notice:

I am sure you must have overlooked my statement of last month as I know your attention to such matters is usually very prompt. Your prompt attention at this time will have the same appreciation you would feel were conditions reversed.

. . . . . .

Or I am counting on your check to help meet some of my drug bills by the tenth.

. . . . . .

Or prompt settlement is desired on business principles.

. . . . . .

Or I know just how these little oversights occur. Don't bother to explain. Simply send your check by return mail and I shall appreciate it greatly.

Get away from the "past due—please remit" style of wording your reminders. Make them live with reasons why the account should be paid and paid quickly. The next reminder should follow quickly after No. 2. One week is long enough to wait when statements have proved ineffective and have decided to push collection. Set the pace and the debtors will respond. If you send your "duns" monthly the debtor will think and promise in months. If you follow him up *weekly* you are more apt to get settlement within as many weeks as you otherwise would in months.

Your third reminder should get down to something of this order:

Surely you received my two previous statements. Why *have I not heard* from you?

. . . . . .

Or I am prompt in responding to your call. Will you please be as prompt in responding to this statement?

. . . . . .

Or I am sorry you were compelled to delay settlement last. Will you please give my account *preference this month?* L

. . . . . .

Or PAST DUE—this is my third statement. Surely I deserve the courtesy of a prompt reply.

The next reminder is even more insistent and should set a date by which time you expect a response. Something like this has been used with success:

Do you realize that your account is four months old? Just why have you not paid? I am willing to accept partial payment if this will accommodate you. Please let me hear from you *before the tenth.*

. . . . . .

Or let's get together. Just what is the trouble? Come in and see me today and we'll talk it over.

. . . . . .

Or I had counted upon an immediate reply to my last reminder. Please don't disappoint me *now.*

At this point some collection departments for business houses send an incorrect statement, i. e., an over charge, which in a goodly percentage of cases brings the debtor in, "with a chip on his shoulder" when of course payment for the correct amount is accepted and appropriate apologies offered. While this procedure is quite effective it is of doubtful ethics and is not countenanced by the better concerns.

By this time you can place your man in one of three classes. Either he is so hard up he can't pay, or he intends to put you off as long as possible (the "I pay my bills when I get ready" kind), or he is the pure unvarnished "dead-beat" who won't pay.

With the first there is nothing to do but coax, and offer a "dollar-a-week" plan of settlement.

With the other two there should be no further delay. A final notice, insisting upon settlement by a certain day should be sent, and followed up promptly with whatever action may be necessary to enforce settlement. Don't be too squeamish at this point. Even if you should lose their future patronage (which is not so certain as some would have us believe)

you have gained their respect, and usually, their money.

Write the man who is hard up something along this line:

I never become uneasy when any of my good friends fail to respond to my statements. I know that there is only one reason for non-payment and that is positive inability to pay. But of course that does not help me in the payment of the accounts I must contract to carry on my practice.

"What is soonest started is soonest finished." You want to get this debt off your hands and I am willing to help you by accepting it in small installments, as small even as $1.00 per week. You surely can arrange to send me this much each week and at that rate it will only be.....weeks until all is paid.

You know I have every confidence in you. By arranging to take care of this little account in this way you will vindicate my faith in you.

If this does not bring results, see him personally and offer to accept his note dated conveniently ahead.

If the debtor belongs to the second or third class, the thing to do is to bring him about sharply. No half-measures are justified at this time. Write him somewhat as follows:

I appreciate your patronage and am always glad to serve you. In return I expect prompt payment for my services. Please do not make more aggressive action necessary by further delay. I do not want to embarrass you but shall have to take definite action unless I have your remittance by the fifteenth.

If you do not hear from him by the "date set," then do something right away. Either give the account to your collector for immediate attention, or take whatever action you are accustomed to with desperate accounts.

The Bank Draft

A bank draft just at this stage is frequently productive of results and should be resorted to more generally. In some communities there is considerable importance attached to a bank draft and the drawee feels that it must be honored or he will be forever under the stigma of "bad credit." Fortunately this impression is rapidly disappearing, but just the same, the drawee naturally wants to appear in good standing at the bank and will often honor the draft rather than have it returned dishonored.

Notify the debtor several days in advance that the draft is to be made at a certain time if payment is not received. A simple, businesslike, impersonal notification is best. As—

I have not yet received your remittance for the enclosed account. I shall find it necessary to draw upon you for the amount through the Bank if payment is not made by.....

Draw on the debtor through the bank in which he keeps his account if you know it. Your bank will ordinarily make out the drafts and transmit them for you if you ask it to do so.

On the date set send the draft to the bank, send also a notice to the debtor, something like the following:

In accordance with my notice of..... I have today drawn upon you through the .....Bank. Please honor the draft at once and oblige.

If the draft is drawn at "sight," the bank will present it right away and if not paid return it the same day. If it is drawn at "three days" or "five days" it will be held that long in the bank after notice has been sent, giving the debtor an opportunity to get the money and protect the draft. The "five day" draft is best.

If the draft is returned it is advisable to send a "final" notice without further delay, and to take vigorous action toward the enforcement of the claim, i. e., to start suit against the debtor.

T. B. TESTING REACHES MORE THAN 1,000,000 IN MONTH

More than 1,000,000 cattle were given the tuberculin test during the month of March. This is the largest number of cattle given the tuberculin test in a single month in the history of the campaign against this disease. The exact number of animals tested was 1,009,731 and out of this number 27,999 were found to be tuberculous.

In spite of this extensive activity, the demand for testing in most states exceeds the present facilities. At the end of March more than 3½ millon cattle were still on the waiting list.

Swine Erysipelas

By A. T. KINSLEY, Kansas City, Missouri

SWINE erysipelas is more or less prevalent in the United States. Diamond skin disease, a mild chronic form of swine erysipelas, has been recognized, particularly by veterinary inspectors in packing houses for many years and more recently an acute fatal type of this malady has been identified in Missouri, Kansas, Colorado, South Dakota, Iowa and Illinois.

Etiology

The cause of swine erysipelas is a small gram-positive, rod-shaped bacterium. This micro-organism is pathogenic experimentally for mice, rabbits and pigeons, and is believed to be the cause of a condition designated "salt water erysipelas" of fishermen. Recent findings by Dr. J. D. Ray of the Kinsley Laboratories, appear to indicate that the causative microbe of swine erysipelas may be an eitologic factor in some disease conditions in other animals.

The mode of dissemination of the infection from diseased animals, the resistance of the micro-organism, and the exact manner of natural infection has not been determined. The disease does not as a rule spread rapidly to all of the swine on a given farm. In fact, in most instances only a relatively small percentage of swine become affected; however, the infection apparently persists when it has once been introduced.

Lesions

The lesions of the mild subacute or chronic form of swine erysipelas consist of:

1. So-called diamond skin disease, a diffuse dermatitis of varying intensity. The area of skin involved may become necrotic and slough as indicated in the accompanying illustration.
2. Arthritis involving stifle, hock, tarsal and carpal joints, the frequency of involvement probably in the order mentioned.
3. Enlarged edematous lymph glands that may or may not be hemorrhagic.

Joint lesions vary from a mild inflammatory disorder in which the synovial membrane is slightly congested and the synovial fluid cloudy to a chronic proliferative inflammation in which the synovial fluid contains flocculi and the joint is more or less deformed because of the excess fibrous tissue.

The skin lesions are frequently observed by the practitioner in the live hog but the joint and lymph gland lesions are usually not observed because such cases are not as a rule fatal unless there are complications.

The above is from a photograph taken by Thomas B. Tipton of Hume, Missouri. It will be noted that there is an area of skin on the back in the process of sloughing. Necrosis and sloughing of skin is common in the subacute or chronic form of erysipelas. Doctor Tipton has encountered swine erysipelas on several farms in his community.

The skin, joint and lymph gland lesions may occur singly or in various combina-

tions. Again, the skin lesion alone may be observed in one hog, the joint lesion in another and the lymph gland lesions in still another in the same herd. In a more severe form of the disease there is swelling and later sloughing of the ear and sloughing of the tail and feet.

The septicemic form of the disease is characterized by parenchymatous degeneration of the vital organs, and there is usually an edematous tumefaction of various lymph glands, the spleen may be tumefied and there may be an acute gastro-enteritis. In some cases the disease is so rapidly fatal that there are no definite lesions.

Symptoms

The symptoms of the mild form of the disease are indefinite. There may be cutaneous erythema (diamond skin disease) skin sloughs, lameness, enlarged joints, sloughing of ears, tail or feet, depending upon the apparent localization of the infection.

The septicemia form of the disease has a sudden onset. The affected animal is indifferent, usually refuses food, retches frequently and may vomit, has a high temperature and may evidence disturbance of the cerebral functions. There is marked weakness and a tendency to incoordination in the hind legs. The conjunctival mucous membrane may be congested and the eyelids swollen. There may be grinding of the teeth and diarrhea is usually present. This form of the disease runs a rapid course and is usually fatal.

Control

Control measures consisting of isolation of affected individuals and the rigid application of sanitary measures are undoubtedly of value in preventing the spread of this malady.

In several instances autogenous bacterin has apparently given good results.

Swine erysipelas in itself is not a serious malady; however, this disease not infrequently occurs as a complication of other diseases in which the losses may be extensive.

THE VETERINARIAN AND PREVENTIVE MEDICINE

The day is close at hand when the veterinarian who fails to pay more attention to preventing disease than the majority of us have in the past, will not be considered as valuable an asset to a stock raising community as one who does make a close study of this branch of veterinary science.

Great strides have been made in preventing communicable diseases, and we deserve commendation for it, but we have too often neglected the study of the prevention of sporadic diseases, which causes annually a large monetary loss. As an example of this neglect, I wish to mention one disease that can be largely prevented by proper methods of feeding and sanitation—periodic or recurrent ophthalmia.

Heredity is an important predisposing cause of periodic ophthalmia. The essential or direct cause being an autotoxemia which in turn is due to a lack of mineral constituents, mostly calcium and phosphorous, in the daily ration. There is no successful treatment after the animal has had a half dozen seizures, although recurrence can be largely prevented by proper dieting and instituting proper sanitary measures.

Periodic ophthalmia can be prevented by feeding the dam, prior to foaling, a well balanced grain ration in which both the carbohydrates and proteids are in an available form. To this should be added 4% of a well-balanced mineral mixture, to be fed every day in the year, even if the mare is on pasture.

The colt being born from a mineral-fed mother will need no minerals other than those contained in its mother's milk until about four months of age, when it should be fed a sloppy bran mash twice a day with about a teaspoonful of a proper mineral mixture in each feed until grown, when the amount of mineral should be increased.

G. W. Browning.

Mobile, Alabama.

Caponizing Poultry

A CAPON is a male bird from which the reproductive organs have been removed at an early age. The operation, called caponizing, causes a change in the entire physical make-up of the bird and alters its general shape and plumage. The advantages of caponizing may be listed as follows:

1. Larger and heavier fowl at killing time.
2. Sweet and finer flavored meat.
3. Much higher selling price.
4. Lower production cost, due to greater efficiency in the utilization of the feed consumed.
5. More quiet disposition, standing confinement better.
6. Useful for hovering young chicks.

Caponizing may be done at any time of the year. All the heavy breeds of poultry make good capons. The most convenient size, preferred by most operators, is a bird about six weeks of age and weighing one and one-half to two pounds. The comb has just begun to develop at this age so the sexes may be distinguished, and the testicles are still somewhat smaller than navy beans.

Preparation

The birds to be caponized should be starved for twenty-four hours previous to the operation. This leaves the intestines empty and they do not obstruct the view when locating the testicles. The birds should be kept in a clean, airy place so the feathers and feet will not be unduly soiled. After the operation the birds should not be allowed to gorge themselves, although reasonably heavy feeding usually does no harm.

An upturned barrel or box of proper height makes a very convenient operating table. An abundance of light is necessary to locate the testicle through the small opening between the ribs. Out in the open on a sunny day makes the best operating amphitheater. When working inside, a small electric head lamp will be found useful.

The birds are held in position by fastening one cord around the wings and one around the legs letting the weights hang down over the side of the operating table. A bow shaped like the half of a barrel hoop is sometimes used to hold the bird properly stretched out.

The instruments necessary for the operation are: scalpel, spreader, sharp pointed hook, testicle removers, and two cords, each having a hook at one end for ready fastening to the wings or legs, and a weight at the other end. The newer designs in caponizing instruments have many advantages over the old styles.

The spreaders should not be too clumsy nor have hooks that will injure the tissues. The type built on the plan of a pair of scissors with an easily operating locking device is preferred. The testicle remover must be wide enough to grasp the entire testicle, otherwise slips will occur. The usual width of one-half inch is sufficient for ordinary birds but is too narrow for older or early devoloping birds. This instrument should also be provided with a secure locking device and be free from projecting parts. A small, light scalpel is preferred to a heavy one. The sharp-pointed tenaculum is used to tear the abdominal peritoneum.

Some antiseptic should be used to keep the instruments clean and to dampen the feathers over the wound area.

Seat of Operation

With the bird well stretched out the feathers are plucked from the region in front of the thigh. The incision is made between the last two ribs. This is very important because an error at this point makes the operation a difficult one. An incision further forward will pierce the lungs and one further backward may in-

jure the kidneys. In addition to these accidents the operation is made tedious by difficulty in locating the organ sought.

Both testicles may be removed from the same opening but usually this is found more difficult and the injury to the bird is liable to be greater than where openings are made on both sides.

The Operation

With the bird placed left side up, well stretched out on operating table, feathers plucked and last rib located, an incision is made by thrusting the sharp scalpel between and parallel to the two last ribs. The incision should be made through the skin and the intercostal muscles. (It is not necessary to pull the skin either forward or backward as the incisions through the skin and muscles do not approximate when the bird is released.) The incision is made about one inch in length. The spreaders are inserted so that the points extend through the visceral surface of the ribs.

The testicles are brought into view by puncturing the peritoneum with the sharp-pointed hook. The characteristic yellowish colored and bean-shaped testicle can be readily recognized if the incision has been made correctly. When one has difficulty in locating the testicle it often helps very materially to have an assistant raise and manipulate the front part of the body. Occasionally one finds a testicle black in color which is hard to distinguish from the posterior aorta.

The removers are next inserted through the opening, the testicle firmly grasped and with some torsion and a quick jerk the testicle is removed. The quick jerk can be used only in removing small and undeveloped testicles. More torsion and gradual traction is necessary when the testicle is well developed. To prevent "slips" one must be careful to remove the testicle intact and not leave a small piece of testicular tissue or tunic anywhere in the abdominal cavity.

The spreaders are then removed, the bird is turned over and the operation is repeated on the other side.

No surgical dressing of the wound is necessary.

After care consists of feeding the birds soft and easily digested food for a few days and housing them in a place where they will not have opportunity to fly off the floor until the wounds are well healed.

Sequelae

Hemorrhage: Internal hemorrhage may be caused by puncturing the posterior aorta or injuring the kidneys. Death usually takes place suddenly and the carcass may be dressed for food. Poorly constructed instruments are often the cause of injuries resulting in hemorrhage.

Wind puffs are formed by the accumulation of air beneath the skin. They usually occur between three and six days after the operation and may become very severe and distort the figure beyond recognition. The accumulation of air is due to injury of the lungs or abdominal air sacs which cause interference with the natural air passages. This trouble is usually easily remedied by puncturing the skin and letting the air escape.

Slips: When a piece of the testicular tissue is left in the abdominal cavity some regeneration will occur. Enough secretion will be produced by these cells to develop male characteristics and defeat the purpose sought. Slips are not potent males and should be culled from the flock as soon as possible.

Feeding Capons

Capons may be fed the same ration as other poultry. Various mixtures of ground corn and wheat products containing about twelve per cent animal protein in the form of milk or meat scraps form an excellent growing mash. Plenty of greens, grit and oyster shell helps materially. Two weeks before marketing the birds should be confined in smaller pens and the corn and milk ingredients of the ration increased.—Mo. State Poultry Experiment Station.

Pneumo-enteritis of Puppies*

By R. H. SMYTHE, M.R.C.V.S., Camborne, England

A HIGH rate of mortality, occurring within a few days of birth, has, of late years, become general throughout the breeding kennels of this country. It is probably no exaggeration to assert that, on an average, not less than thirty per cent of all pedigree puppies die before they are four days old and that a further five per cent succumb before they attain the age of three weeks. A careful estimate of the number of births and deaths occurring in a group of kennels, in the same district, over a period of three years, yielded an average mortality of sixty per cent of puppies born alive, but this calculation made no allowance for puppies born dead at full period, many of which, in strict accuracy, should have been added to the list.

Probably the rate of mortality is higher in some localities than in others, but quite apart from the reports of veterinary surgeons, the constant repetition in the "veterinary columns" of the canine periodicals, of queries relating to the deaths of newly-born puppies, is, in itself, an indication of the serious and widespread losses sustained by breeders.

The condition responsible for this mortality may be defined as an acute enteritis, accompanied or closely followed by pneumonia, with effusion into the serous cavities.

Symptoms

These are usually first manifested within a period ranging from the moment of birth until the fourth day of life. The majority of deaths occur between the first and third days; not infrequently, puppies die a few minutes after birth with well-advanced lesions, and a considerable number of cases have been met with in which puppies, born dead, have exhibited enteritis and peritonitis with an extensive exudation into the peritoneal cavity.

Occasionally, but very rarely, an affected puppy survives the initial severity of the attack, only to die a few weeks later from subacute enteritis and diarrhea. As a general rule, a certain proportion of the litter remains healthy, either from natural immunity or because infection has been escaped by certain individuals, but as it appears that this occurs *in utero,* it is more probable that all the puppies have been equally exposed to infection and that some possess a greater power of resistance.

The mortality seldom affects less than half of the litter but usually only one or two puppies out of an average-sized infected litter survive. Those which are largest and fattest at birth, are generally the first to succumb and apparently weakly individuals may survive. This applies more especially to acute outbreaks with very early deaths, as in those cases in which death does not occur until the third or fourth days, the continuous growth of the healthy puppies quickly distinguishes them from those affected.

The sick puppy feels cold to the hand and, although it may manifest every indication of hunger, it fails either to grip the teat at all or else it quickly becomes dislodged by its neighbors. The bitch, herself, usually pushes the puppy away with her muzzle or repeatedly licks it, thus causing it to lose its hold on the teat and roll away into the colder parts of the bedding.

A diseased puppy is noisy and an affected litter may be recognized by persistent squealing in contrast to the contented "purring" sound of a healthy litter, hard at work.

As lung symptoms develop, the puppy lies on its side, opening its mouth widely at each inspiration and exhibiting every indication of asphyxia.

In those which survive the first two days of illness, diarrhea occurs, the feces being thin and of watery consistence.

*Reprinted from the *Veterinary Record,* London, Vol. VIII, No. 12, March 24, 1928.

Postmortem Lesions

In puppies born dead from infected litters, the peritoneal cavity is usually filled either with blood-stained exudate or with freshly-clotted blood. The mucous membranes of the intestinal tract are thickened and inflamed. As a rule, the stomach shows no change in any type of the disease.

When death has succeeded an illness extending over one or more days, both the pleural and peritoneal cavities are filled with a thin sanguineous exudate, enteritis is well established and inflammatory changes have taken place in both lungs. The liver appears normal and the umbilicus shows no enlargement, nor is there any evidence that infection has originated at this point.

Etiology

Microscopical examination of the blood, immediately after death, reveals the presence of numerous bacteria of various types, the majority of which have in all probability invaded the circulation *via* the intestinal mucous membrane. In the exudate, the prevailing organism appears to be a diplococcus, but until further research can be carried out nothing definite can be stated regarding the etiology. All the facts suggest that infection occurs whilst the puppy is still within the uterus, possibly from swallowing infected fluid, and there is no reason to connect the condition with umbilical infection, either pre-natal or caused by unclean surroundings at birth. This latter conclusion is upheld by the fact that puppies are frequently born dead, with well-established lesions.

Certain bitches appear to infect each succeeding litter, whilst other bitches kept in contact, whelping in the same houses, and, even as has happened during our investigations, at the same time, may rear entire litters without loss. It also appears that the surviving bitch puppies from affected litters infect their progeny in turn, when their time comes to whelp. This rule has held good through three generations in bitches kept under observation.

In order to determine whether umbilical infection at birth, or afterwards, was responsible, a maiden bitch was selected, the progeny of a dam which habitually lost the greater part of each litter shortly after birth. A week before whelping she was bathed in a cresol solution, her udders and teats receiving special attention. All long hair in the neighborhood of the thighs and belly was clipped off and she was removed to a house which had been thoroughly disinfected. No other dog had ever occupied these premises. The bitch whelped on a sterilized bed and as each puppy was born the navel cord was ligatured half an inch from the umbilicus with iodized silk, divided with sterile scissors and covered with an antiseptic collodion dressing.

The litter consisted of seven strong, fat puppies, all apparently healthy. Each found the teat readily. By the third day after birth six out of the seven had died, and all of these, on postmortem examination exhibited symptoms of pneumo-enteritis, with blood-stained fluid in the serous cavities. The survivor, a bitch, never showed the least sign of illness.

Comment by Professor Williams

A condition, which one must conclude from the description is the same, occurs in American kennels although not to the extent that it prevails in the district in which Mr. Smythe practices. It has been observed however, with considerable frequency in Kansas City. The description all through is so typical of infectious abortion in other animals, that Prof. W. L. Williams was asked his opinion of the matter. His comment follows:

Replying to your letter of the 31st May, enclosing contribution of R. H. Smythe to the Vet. Rec. of Mar. 24, 1928, entitled "Pneumo-enteritis of Puppies," you are doubtless well aware that I am not particularly familiar with canine diseases. What Smythe describes apparently represents genital diseases in general. The expulsion of dead fetuses at all stages of gestation is a phenomenon common to all mammals. Far more fertilized ova die *in utero* than are born. Most of them die so early that they undergo resorption or are expelled when so small that the pregnancy is not

usually recognized and the phenomenon is designated sterility.

Smythe indicates that the deaths of puppies are most common in pedigreed animals. This is the rule in all species of mammals and rests upon fairly well known causes.

Smythe states that the puppies die chiefly of enteritis with diarrhea or from pneumonia. Diarrhea and pneumonia cause most deaths of new-born mammals of all species. The functions of the digestive system are suddenly and materially altered at birth and may give way to the new strain. Smythe records that in the fetuses expelled dead at term, the enteritis was already present, but he is silent upon the question of fetal diarrhea. Fetal diarrhea is almost universal in bovine fetuses which are aborted; the same is true in sheep according to my observations, and is represented generally in equidae by over-distension of the intestinal tract with meconium. Pneumonia is highly common in calves, but naturally not in fetuses.

So far as I have observed, the bovine fetus is especially prone to diarrhea. In slaughtered, pregnant cows, diarrhea is observed in fetuses ten inches long, its frequency increases as gestation advances, it is very common as term is neared, is not rare at time of birth, and sometimes when the amniotic cavity contains quarts of fetal feces the fetus has apparently overcome the diarrhea and is viable when born. The diarrhea present at birth may rapidly produce death, or in the young born without diarrhea may break down with fatal or non-fatal diarrhea within a very few hours. If the fetal membranes of such a fetus are examined, extensive placental lesions are present and these represent corresponding lesions of the endometrium.

As Smythe suggests, the diarrhea of the new-born is of antenatal origin. It is clearly referable in the very early cases to endometritis of the mother. Moreover, in the cow, when the endometritis becomes critical, the most striking phenomenon *in her* is severe diarrhea.

Diarrhea and pneumonia then are common phenomena of critical disease in the newborn, and diarrhea is a common phenomenon of the diseased fetus. The rule appears applicable to all mammals, with the limitation of the equine fetus and the foal where constipation displaces the diarrhea until some days, or at least some hours, after birth.

Smythe makes the significant observation that the bitch repels the sick puppy and refuses to permit it to suck. The ewe shows the same repulsion for a lamb born with diarrhea. Much has been written regarding the repulsion of the new-born by the dam. The sow varies this attitude by becoming a cannibal, or a scavenger (?) and devours her young. Sometimes this repulsion of the young is unquestionably due to the fact that it is diseased in such a manner and to such degree that the mother recognizes the young as unnatural and consequently outside maternal attachment. The sow is a natural scavenger and logically devours anything repulsive which comes within her field. It is not at all impossible that most instances of the refusal of the dam to care for her young is owing to the presence of important disease, and the mother takes no worry from the fact that the disease of the fetus was derived from her own uterus, and perhaps that she in turn, acquired it from the sire.

The suggestion in your communication that the phenomena described by Smythe may be "similar to abortion disease in swine" can not be directly answered because no adequate definition has yet been formulated for abortion disease. It is now generally held that Bang's bacillus causes undulant fever in man and is frequently present in fistulous withers in geldings, yet it would be straining our language to dub undulant fever or fistulous withers as "abortion disease." So far as definitely recorded, all abortions are due to, or at least associated with, endometritis, and inevitably with fetal placentitis. Endometritis may be present in a location, or in a degree which does not result in abortion. Instead the fetus may be born seriously or mortally infected, as appears to be the case in Smythe's cases. Whether the expulsion of dead fetuses at term, or the birth of mortally infected young should be termed "abortion disease" is purely a matter of taste—or of definition.

Your observation that fox breeders are complaining of the frequency of the expulsion of dead, along with living fetuses at term or of small litters and your belief that the difficulty is primarily nutritional, gives room for considerable discussion. There seems to be some danger of confusion in this respect. As stated above, all cases of abortion recorded, where observations have been definitely stated, have been associated with endometritis and fetal placentitis or chorionitis. The lesions are those commonly associated with the ravages of bacteria. It is largely, if not generally believed that lowered vitality of an animal increases its vulnerability to bacteria or other forms of virus present. The vitality of an animal or of an organ may be so low that bacteria commonly present but not visibly harmful, may be enabled to seriously invade the host. On the other hand, there may be introduced through a variety of channels, a quantity or quality of virus which may overpower most of the strongest animals, as in anthrax. It appears to me safer and clearer to say that in the one instance the *dominant* factor is the volume or virulence of the infection, in the other, the power of resistance in the animal; but in each case both factors are playing their role. Looking at the matter from this standpoint, one is quite justified in concluding in one case this factor, in the other, that cause plays the more important part.

NEEDLING CATARACTS

Discission or "needling" is a simple operation for the removal of cataract in the dog that I often perform. It should be a common procedure in canine practice.

The dog does not regain normal vision, because it is of course not practical to fit the canine patient with glasses, but it is able to see well enough to make the old fellow's remaining days a little brighter, in fact literally very much brighter. Improved appearance of the eyes is another advantage of the operation.

I find that only in one eye out of three or four double operations (I always operate on both cataracts during the same operation) requires a second operation.

The operation is simple. The requisites are:

1. Good anesthesia.
2. Absolute asepsis.
3. *Not* wounding the iris.

I always insert the needle from the centre on top at the scleral junction. There is a tiny swelling that remains at the point of puncture about as big as the end of a match. It resembles a small vesicle and is, as a rule, entirely absorbed after about ten days to two weeks. I have never had any permanent scar to remain; but it is out of the way, if a slight "nick" should remain.

The bandage is left on for a week and taken off at night.

The thing desired is to break up the lens so it is absorbed and this is easily done.

New Orleans, La. W. J. Ratigan.

TUBERCULOSIS ERADICATION INCREASES MILK PRODUCTION

Compilations made by H. E. Denlinger, statistician of the Maryland State Dairymen's Association, shows a steady increase in the production of milk in the Baltimore territory during the last three years in spite of a decrease in the number of cows, largely due to tuberculin testing.

The average production per day per farm increased from 18.46 gallons in 1925 to 19.76 gallons in 1927. This increase is approximately 7 per cent.

Another interesting development has been the more uniform production of milk at all seasons in the place of a fluctuating milk flow, high in the spring and low during the last three months of the year.

"The eradication of tuberculosis," says I. W. Heaps, secretary-treasurer of the Maryland State Dairymen's Association, "is not only profitable to the producer from the standpoint of having healthier and higher-producing cows, but it has given the city of Baltimore milk of higher quality, back of which the Health Department can stand."

Some Old and Forgotten Remedies

By G. W. BROWNING, Mobile, Ala.

I WISH to call attention to three botanical drugs that were in great repute at one time, but of late have been almost discarded, mostly on account of not using them where indicated, or using them in doses that were too large.

Bryonia Alba.—Bryonia is a climbing plant and indigenous to northern Europe.

Constituents.—Bryonin, starch, gum, sugar, albumen, wax, fat and various salts. The dose of the specific tincture for the dog is from one-tenth minim to two minims.

Therapy.—Bryonia is a remedy of great value in the treatment of all acute inflammations of the thoracic viscera or of the pleura. In pleuritis its indications are usually all present. Uncomplicated cases will yield to this agent alone. Usually more rapid results will be accomplished by alternating it with aconite or with *Asclepias tuberosa.*

Bryonia is a sovereign remedy in the beginning stage of distemper in dogs, cats and foxes, especially if the ailment is accompanied by frequent coughing and sneezing. In these cases I use the following:

℞ Bryonia Lloyd .....M xv
Pertussin q. s.....℥ iv
M.
Sig. One teaspoonful every two hours till cough gets less frequent.

In large doses, bryonia is an active hydragogue cathartic and sometimes causes inflammation of the stomach and bowels. In poisonous doses it causes a lowering of the temperature, dizziness, delirium, weak pulse, cold perspiration, dilated pupils and other evidences of a depressing action on the nervous system.

It has been giving these large doses in the past that has caused physicians to abandon this, one of our most valuable drugs when properly used.

I will make this promise to the small animal practitioner: I don't care what your favorite cough medicine may be, if you will add ten minims of bryonia to each four ounces of such mixture given in dram doses, you will get results that will astonish you.

Juglans Cinerea.—Synonym—Butternut. Part employed, the inner bark of the root and by some the bark of the tree.

Physiological Action.—Experiments with this drug have ascertained that it influences, with great energy, the liver, small intestines, colon and rectum, causing an increased manufacture and elimination of bile as well as increased activity of the glands of the intestinal tract, making it a valuable agent in all forms of autoxemia or autointoxication, whether from fermented food in the intestinal tract or from the toxins formed by diseased germs.

Chronic constipation can be successfully corrected by medium doses of the extract. Combined with other agents, as hyoscyamus, belladonna, nux vomica, leptandra or capsicum, a most excellent pill can be made which will cure many cases of the above conditions and will stimulate the stomach and intestinal tract in those atonic or debilitated conditions which induce chronic dyspepsia.

However, its greatest value is in the treatment of all non-parasitic skin diseases. It is specifically adapted to skin diseases associated with some abnormal condition of the intestinal tract. Not all skin diseases of the dog nowadays, that are called mange by the laity, are due to the mange parasite, but rather to toxins formed during the process of digestion, which escapes the intestinal tract without being acted on by the pancreatic and hepatic ferments, consequently enters the circulation as a poison which finally gains access to the skin, producing a condition too often called mange. While true scabies or mange may be cured by local applications alone, those constitutional cases require eliminants as well, and it has been my experience that they are never completely cured without them. And it is in

these conditions where Juglans shines, and as most of these cases are accompanied by an acid condition of the system, I have been in the habit for several years of using the following prescription:

℞ Juglans (Lloyd) .....℥i
Glycondia (Lloyd) q.s....℥iv
M.

Sig. One dram three times daily and, as the animal improves, twice a day.

This is one of the best remedies for acidosis in small animals that I have yet used, and will correct that vomiting and dysentery in puppies better than any other preparation that I have been able to find; however, if infested with intestinal parasites, the animals should be given the proper vermifuge.

Scammony.—Part employed. The concrete juice of the root.

Therapy: Scammony is a vermifuge and is useful in combination with other vermifuges to increase their action. It also acts as a cathartic, and its cathartic influence in vermifuges is of considerable importance. It is a hydragogne and is irritating in large doses and more or less depressing. It has certain eliminating influences, and, like podophyllin, has been given in conjunction with alteratives. The resin of scammony is the part used for anthelmintic purposes. Dorling gives the dose from 2 to 10 grams, and Finley Ellingwood in his therapeutics gives the dose at from 3 to 6 grams, both of these doses are too large, especially if they are to be repeated.

Scammony is a most useful drug, both as a cathartic and a vermifuge, but where scammony got its waterloo was several years ago by physicians using it in entirely too large doses.

Why should veterinarians in giving anthelmintics that require to be followed by a physic, give castor oil or epsom salt? Why not give a cathartic that has anthelmintic properties as well, such as scammony, gamboge, or podophyllin, which would probably get more worms? Even kamala, which is claimed to be sufficiently laxative, has in my experience been much improved when accompanied by a cathartic. Correctly used, kamala is one of our best remedies.

SUCKLING SOWS "BREAK DOWN" FROM MINERAL DEFICIENCY

Last spring we had two very interesting cases of sows that broke down in the back when their litters were about four weeks old. We have a large farrowing house equipped with steam heat, where we placed the sows for their early spring litters. These two sows had farrowed early in February. One of them was purchased at an auction sale and the other was of our own breeding. Our sows are kept in the large farrowing house until their litters are from two to four weeks old, the length of time depending entirely upon the weather.

When these two litters were about two weeks old, we decided to move them to a clean lot into individual houses. Instead of hauling these sows and their litters as we usually do, we hauled the litters in boxes and drove the sows on foot. We had never observed any evidence of any weakness, lameness or any other symptom of breaking down in the back of these two sows yet before reaching the lot, which was about one-fourth mile from the farrowing house one of these sows stumbled and was unable to get upon her feet. The other sow also broke down before reaching the lot. These cases both occurred on the same day.

The sows were returned to the community house, where I saw them the next morning and prescribed 100 lbs. of tankage with 15 lb. of bone meal, each sow to receive one-half to three-fourth lb. in middlings and milk slop night and morning, with three tablespoonfuls of cod liver oil. The herdsman doubted at the time whether this was due to a mineral deficiency, but the pigs were weaned at once and after a couple of days the sows were moved to a small lot and placed in a small house. They were dragged into sunlight each day and were continued on the cod liver oil and mineral ration mentioned above. For several days it was necessary to hold these sows in position to eat, but after about three weeks, they were able to walk, and at the present

time there is little or no evidence that they have been affected in any manner.

The peculiarity of these cases to the writer is the fact that they did not show any preliminary symptoms of this trouble. I have seen a number of cases of this kind in times past, but all of them showed prodromal symptoms of mineral deficiency and their breaking down was expected. Both of these cases manifested themselves just as though the animal had suffered from broken bones. In my experience it has been unusual for brood sows to become affected so quickly without showing any symptoms of the approaching condition.

George H. Conn.
Freeport, Ill.

MANDRAKE (MAYAPPLE) POISONING IN HOGS

I was called to the farm of a client to examine hogs dying rather suddenly and apparently healthy otherwise.

These hogs weighed about 160-170 pounds and were nearly ready for market. They had been vaccinated when weaned and were doing fine in a dry lot; but as grass came, they were turned out to pasture, which was mostly upland or hill pasture.

The hogs were fed grain and then turned out in the morning. Before noon, five hogs were found dead or dying, showing more or less of a staggery gait, some convulsions, rapid respirations, temperature about 104° F. All five were dead by noon. On postmortem examination I found lymph glands injected, kidneys specked with petechia very much resembling cholera. Stomach and intestines somewhat inflamed.

On examining the stomach contents, I found grain eaten in the morning, also quite a large quantity of green food. I found quite large pieces of leaves, also stems that looked as though they had been about the size of a lead pencil before eaten.

So I went over the pasture and found one quite large patch of Mayapple that was simply eaten to the ground, only a few leaves were left standing. I ordered the hogs kept out of this pasture. No more died.

This case was interesting in that the lesions so closely resembled those of cholera.

J. B. Gingery.

Muscatine, Iowa.

MY MOST EMBARRASSING MOMENT

About the most embarrassing circumstances that ever confronted me on a professional call occurred a good many years ago, when I was practicing in Chicago. One of my clients called me to see the family dog, a bitch, that I had treated a number of times before. The dog was very old and had recently gone blind and was in an almost helpless condition. I advised that the animal be humanely put out of misery, to which my client consented and the animal was destroyed.

This occurred on the ground floor in a rather large apartment building, and as I was leaving I met, in the hallway, an old lady whom I had never seen before. She immediately said: "Good morning, doctor. How's the patient?" I thought perhaps she was some relative of my client and knew all about the case, since she addressed me as doctor. After a slight hesitation, I said: "Well, the old bitch was blind and generally helpless, and we thought it best to put her out of the way, so I just chloroformed her." Just as I got that far the old lady let out a scream and then another and then another and fell down in a heap on the floor and commenced to sway and moan. I think everybody in the apartment house came out and hung over the banisters to stare and then came downstairs to find out what was the matter.

I didn't know, but the questioning developed the fact that this old lady's sister who lived on an upper floor was then very low and the doctor was coming to see her every morning, and she was blind! The old lady could see but poorly herself and, seeing me with my medicine case, took me for the family doctor. She raised the disturbance because I told her, as she thought, that her sister was out of her misery.

Los Angeles, Calif. C. A. White.

This illustration shows a train on which was made a shipment of mules, jennetts and jacks fro Louis, load of mules that has been purchased in this country and shipped to Spain since 1919. Because of th all losse These mules were bought throughout the central states and concentrated at St. Louis. Only tw les out o mules had been on clover hay and a full grain feed, consisting of shelled corn, oats and oat bran April 12 The mules were loaded at St. Louis April 16th, between the hours of 7:30 and 10:30. The tra the yar proximately 30 miles per hour.

The mules were unloaded on April 17th, at Knoxville, Tenn., given a five-hour rest and a fee timothy fed timothy hay.

In this shipment there were, in addition to the 1231 mules, 25 jennetts and two jacks. Several e jennet casualties.

On some of the previous shipments a few cases of enteritis had developed at Salisbury or betwe isbury a apparently becoming a factor in the shipping of mules, particularly through the south.—A. T. K.

TREATMENT FOR "RED WATER" IN CATTLE

We were much interested in the article, "Red-Water Disease in Dairy Cows," appearing in VETERINARY MEDICINE for June, 1928.

My associate, Doctor Drew, has had some twenty-five years' experience in handling this condition in cattle and under his line of treatment we rarely ever lose a case. In view of this extensive experience we feel competent to comment on the article and to offer suggestions as to the line of treatment.

The symptoms as given by J. W. C., of Utah are typical. We might add, however, that the bowel movements are somewhat retarded and greatly diminished but generally of a normal consistency. To one familiar with the condition, it can be diagnosed almost at sight for the pounding heart and blanched membranes are very noticeable.

According to our experience, this condition is not at all a seasonable occurrence but comes on any time during the year, and with about the same frequency as do our cases of post-parturient paresis. It will occur in cows kept and fed under the most ideal conditions as well as in those kept in open quarters and poorly fed. We have seen the same or a similar condition in bulls and steers, especially those fed on beet pulp. We do not believe the condition is at all contagious but seems to be more on the order of a toxemia.

It generally comes on two or three weeks after calving but we have known it to occur several months after calving and by keeping a careful check on these cases, we find the majority to have eaten their afterbirth. Whether this has anything to do with the condition or not, we do not know.

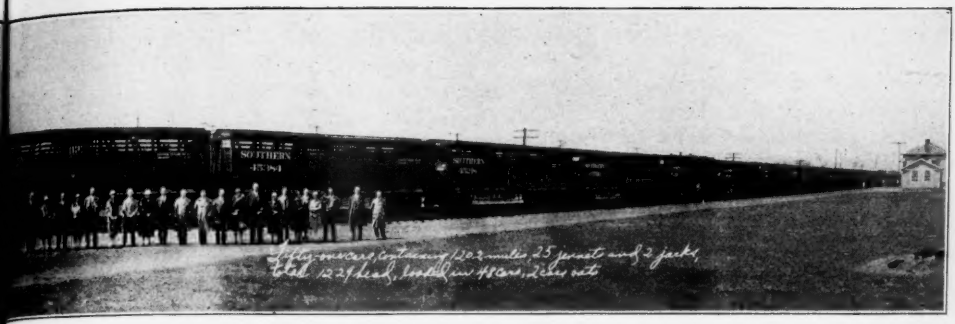
The treatment we administer consists in a teaspoonful of adrenalin chlorid (1:1,000 solution) in a half pint of water given as a drench three times a day. In conjunction with this, we put them on the following:

Iron sulphate (exciccated)	ʒ ii
Nux vomica (powdered)	ʒ ii
Gentian (powdered)	ʒ ii
Ginger (powdered)	ʒ ii

M. et fiat such pulv. No. XII

Sig. One powder in a pint of water twice a day. Given as a drench.

Normal salt solution enemas are also given three times a day and the patient coaxed to eat as much as possible by tempting her with succulent feeds of all kinds. In cold weather the legs and tail should be well bandaged to



Louis, Mo., to Norfolk, Va., From Norfolk they were shipped to Spain. This was the 44th train
ll losses in this shipment it is of interest to veterinarians.
s out of a total of 1231 were unfit for shipment upon arrival at the port of debarkation. These
April 12, 1928, at which time timothy hay was substituted for the clover.
the yards at 11:30 and ran on a special schedule, making the run to Norfolk on a schedule of ap-
timothy hay. They were again unloaded at Spencer, N. C., April 18th, and given a 24-hour rest and
e jennetts were markedly emaciated and weak. Two of them died enroute. There were no further
sbury and Norfolk. The exact cause of the enteritis has not been determined, but this malady is

prevent freezing and the cow put in a warm stall with plenty of bedding. Fresh water should be kept before them at all times. Under this line of treatment the urine generally clears in thirty-six to seventy-two hours and complete recovery is attained in from seven to ten days.

Laxatives or physics of any kind are absolutely contraindicated as the bowels will return to normal as the cow begins to eat and drink and gains in strength.

We have had no better results by giving the adrenalin hypodermically than per os and the latter method is the preferred one as it can be administered by the owner of the patient. We have also tried intravenous injections of normal salt solution with no better results than when given per rectum. Recently we have used glucose with good results and a more rapid recovery. We have given it intravenously and per os in one pound doses. We prefer the oral administration, one pound given three times a day, as this is the more practical treatment to leave with the owner.

In some cases the tail and dew claws will slough off from impaired circulation although the animal will recover.

We trust the suggestions offered may prove of value to those confronted with this condition of red water in dairy cattle.

J. W. Paige.

Grand Junction, Colorado.

SERUM FOR RED-WATER DISEASE OF CATTLE

We were interested in the report on red-water disease in dairy cows given on page 268 of the June issue of VETERINARY MEDICINE.

There has been developed an Anti-Red Water Serum which has given very good results in the treatment of sick animals. Where infected animals are treated with this serum during the early stages of the disease a good percentage of recoveries may be expected. It is useless, however, to attempt treatment during the latter stages of the disease. A large dose of serum is required in treatment if results are to be expected, but above all it must be given in the early stages.

Red Water Vaccine is being used routinely in badly infected areas here on the Pacific Coast Region and reports are consistently satisfactory. Losses are reduced to a minimum, and in fact, vaccinated animals rarely, if ever, succumb to the disease.

Cutter Laboratory, E. A. Cutter, Jr.

Berkeley, Calif.

EPILEPTOID CONVULSION IN A BULL.

Some information on the following case will be appreciated: A breeder of pure-bred Herefords has lotted together eight yearling bulls and sometimes the herd bull. Naturally there is some strife and antagonism to see who is boss in this bull pen.

A few days ago I was called to this farm to diagnose a condition in one of the young bulls. This bull was, at this time, in a pen by himself. On a causal examination nothing abnormal was observed. The temperature was normal; he was ruminating and attempting to butt one of the other bulls in an adjoining pen. After about thirty minutes this bull walked to the opposite end of the lot, elevated his head, breathed rapidly and fell. He was unconscious for about one minute, when he got up and was apparently normal. According to the herdsman, these attacks occur several times during the day and night. Occasionally in an attack the bull will pitch forward similar to the way a dog will fall with strychnin poisoning.

These bulls are all fed a generous ration containing corn chops, bran and oil meal in the usual ratio. They have not been receiving any hay for about two weeks.

Any information that you can give will be appreciated.—I. J. P.

Reply: It is difficult to make a diagnosis at a long distance. From your description it is probable that the attacks in the bull are due either to disturbance of circulation or to some involvement of the central nervous system. You did not state in your inquiry whether you made a careful examination of the heart. A condition very similar to that in the bull has been observed in cattle in which there was a foreign body puncturing the heart. In such cases there is later sufficient evidence upon which a positive diagnosis of traumatic pericarditis can be made. Attacks may be the result of acute dilatation of the heart. Similar conditions may also result from organic disorders of the heart.

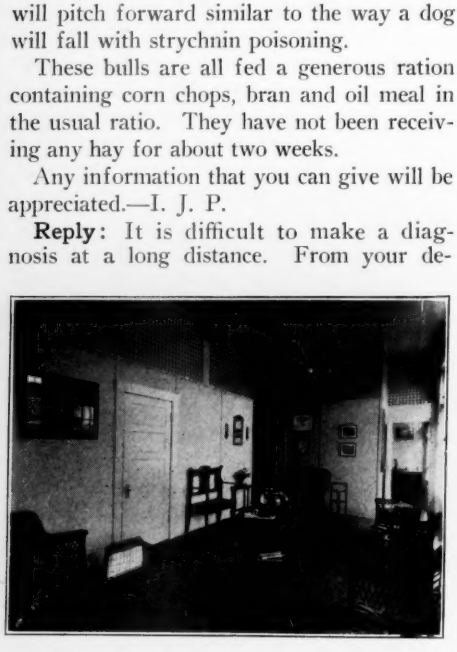
If the condition is due to some involvement of the nervous system it may or may not be the sequel to some disease or traumatic injury. A condition similar to epilepsy in the human has been observed in animals. The mild form of this malady is evidenced by sudden attack, momentary loss of consciousness and a rapid apparent complete recovery. These attacks may occur more or less frequently as the animal ages.

Finally, the condition may be the sequal of an injury. Such an injury may have involved the region of the occipit bone. In such cases the symptoms manifested may be very similar to those that you have described, namely, elevation of the head, falling, etc.

If the condition is due to a foreign body in the region of the heart, the only treatment would be operative, including the removal of the body. Those cases resulting from organic cardiac disorders, and acute dilatation, in young animals, may be benefited by the judicious administration of such agents as digitalis.

Epilepsy and closely related conditions are, generally speaking, incurable. Injuries in the occipital region, particularly in those cases in which symptoms are the result of pressure due to an accumulated exudate or fibrous proliferation, may be partially relieved by the long continued use of small doses of potassium iodid.

The foregoing are only suggestions. We shall be glad to have further information on this case.—A. T. K.



Waiting Room in the new hospital constructed by L. E. Casey, 2221 Cedar Springs Road, Dallas, Texas. A view of the exterior of this hospital was shown on page 322 of the July issue of VETERINARY MEDICINE

BOOK REVIEW
General Microbology

A text book on General Microbology, by Ward Giltner, Professor of Bacteriology and Hygiene, Michigan State College; published by P. Blakiston's Sons & Co., Philadelphia; 471 pages, 99 illustrations, cloth bound; price $3.50.

This volume is intended primarily for the college students of bacteriology. Much of the discussion, however, is quite as valuable to the practicing veterinarian or the sanitarian.

The usual scheme of introducing the subject with well written chapters on general bacteriology has been followed by the author. The book is divided into 31 chapters. A plausible though hardly convincing reason is given for using the term "microbology" instead of "microbiology." The relatively complete chronological table in the introductory chapter will, no doubt, be of considerable value as a ready source of reliable information. Those chapters describing bacteria in the air, soil and water are quite interesting, but contamination through air, soil and water could have been given more consideration with advantage. Yeast, mold, protozoan and filterable viruses, although perhaps not technically a part of bacteriology, have been given consideration by the author, and he should be commended for this, because the relation of bacteria and the other lower forms of life are so interrelated that it is not practical to eliminate a discussion of them from a text book on bacteriology.

The chapter on the relation of bacteria to the dairy industry is quite complete. Various kinds of microbian infections in milk and other dairy products have been given in detail; so also has the source of contamination of milk been discussed as well as the result of such contamination. It is possible that a more detailed description of the method of preventing bacterial contamination of milk might have been given because of the importance of the subject.

A brief chapter on food preservation is interesting and of value particularly to students of domestic science and manufacturers of food products. Many scientific facts have been given in the clear concise manner of the author on the relation of bacteria to various industries such as tanning, bread making, etc.

Several chapters are devoted to the general topic of infection, immunity and diagnosis of infective diseases. These chapters perhaps suffice for a general bacteriology, but if given in more detail the book would have been of more value to medical and veterinary students.

Several chapters are devoted to bacterial infections. In these chapters the various microbes are briefly discussed, including much of their origin and usually the method of infection. However, there is little discussion of the manner in which the microbe produces disease and because of the fact that the book is a general text book on bacteriology there has been little or no mention of the method of control of the disease caused by microbian invaders. In some diseases mention is made of the use of diagnostic agents, such as: tuberculin, Johnin and related products.

As a text on general bacteriology, it is evident that this book will be of very great value. It will be of some value also to veterinarians, particularly because of the fact that it is recent and up to date. All in all, it would seem worthy of a place on the library shelves of the physician and veterinarian, as well as of the college student.—A. T. K.

DEVOCALIZING GOATS

I have seen in one of your journals, the technic of the "goat blat" operation, but I don't seem to be able to find it now.

Will you kindly inform me where I can find information on this subject?—H. J. T., Nebraska.

Reply: The operation for goat blat is the same as the roaring operation in the horse. In other words, it consists of the removal of the vocal cords.—**A. T. K.**

FOX DISTEMPER BEING INVESTIGATED

Frequent requests from fox breeders for assistance in controlling infectious diseases in their animals have prompted the Bureau of Biological Survey of the United States Department of Agriculture to investigate conditions on a number of fox farms. Between the years 1921 and 1926 Dr. Karl B. Hanson and Dr. H. L. Van Volkenberg, of the Division of Fur Resources of the Biological Survey, visited as many infected premises as possible, studying conditions for periods ranging from a day to a week at each. Special note was made regarding the history of the various outbreaks, the rate of mortality, and the class of animals affected, their symptoms and the organs involved.

The source of the disease was directly traceable in the greater proportion of the outbreaks to animals brought from other farms or from fox shows. Whenever a bacteriological laboratory was near at hand, advantage would be taken of the opportunity to send fresh carcasses there for examination. Lack of facilities or funds prevented other studies of the bacteriology or the microscopic injuries caused in these infections.

It was soon found that a very thorough and comprehensive investigation would have to be made of so-called distemper, or of the various diseases known by that name. It was deemed important that the bacteriology and microscopic pathology of the animals affected first be given particular attention with a view to determining the causes of the trouble and working out more accurate methods of diagnosis.

Dr. R. G. Green, of the Medical School of the University of Minnesota, who with a group of associates had investigated outbreaks on large farms near Minneapolis, visited F. G. Ashbrook, of the Bureau of Biological Survey, in December, 1926, and discussed the work done at the University of Minnesota. Fresh material in abundance had been available for his use, and each outbreak was kept under close observation throughout its entire course.

A program of cooperative research on diseases of carnivorous animals was entered into between the Biological Survey and the University of Minnesota on October 1, 1927. The work has been carried out under the combined direction of Dr. J. E. Shillinger, of the Bureau of Biological Survey, and Dr. R. G. Green, of the University of Minnesota. The cooperative undertaking had the benefit of almost three years' earlier work by Doctor Green and his associates. Dr. Earle T. Dewey and Dr. Newell R. Ziegler, who have been associated with Doctor Green since the time he began his fox-disease investigation, have continued as part of the staff of nine workers under the cooperative program.

When the University group started its investigations its activities were directed to the study of a bacterial infection that was present on a number of fox ranches in Minnesota. This disease, known as fox paratyphoid, disappeared in Minnesota and was followed by another, discovered by Doctor Green, and here tentatively called epizootic fox encephalitis, to which investigations are now being directed.

Fox Paratyphoid

On a number of fox ranches in the Northwest an infection known as fox paratyphoid occurred during the fall of 1924 and the winter and spring of 1925. It appeared to be a disease of young foxes rather than adults. On affected ranches the young would die in large numbers, while only an occasional breeding animal would succumb. The mortality in its typical course ran as high as 60 per cent of all the younger animals on a ranch. Bacterial vaccine tended to control the disease on these ranches, and the fox paratyphoid has not been encountered by the University of Minnesota group since the summer of 1925. The very fact that it has disappeared from view is strong evidence that the disease studied was a prim-

ary infection, and if so, that it can be expected to reappear in epizootic form sometime in the future.

Epizootic Fox Encephalitis

Following their work on the paratyphoid infection, the University group began investigations of a second disease of foxes that previously was not described or was known under the name "distemper," and now is tentatively being called epizootic fox encephalitis. The solution of the various problems, especially the development of a preventive vaccine, will undoubtedly require the major efforts of the group for several years to come.

This disease was first encountered in the fall of 1925. It was recognized first in groups of animals that had been immunized with the paratyphoid vaccine. The evidence that foxes so vaccinated were resistant to an infection by the same organism indicated that a new disease was being dealt with in vaccinated animals. Accordingly transmission experiments were carried on with foxes that had been so vaccinated.

Epizootic fox encephalitis has been present on numerous ranches throughout the United States during the past three years. Outbreaks developed following fox shows at Portland, Me., and Buffalo, N. Y., in 1925, and have been present on many ranches under observation continuously since that time. It appears to be a disease of adult foxes as well as pups, and in outbreaks studied deaths in adults have been as numerous as among the young. Even on a carefully supervised ranch the majority of animals are found dead even though only a few hours before they were apparently well. Sick foxes when found may show convulsions, extreme weakness, paralysis, or sleepiness. All the various symptoms appearing in ranch animals have been reproduced in animals artificially infected from a single sick fox, showing that all these manifestations are part of the same disease.

The animals dying from experimental infection appear the same in all ways as do the animals dying on a ranch. On a ranch the mortality from this disease does not often exceed 15 per cent, but a number of epizootics have been observed where it was as high as 40 per cent. Positive diagnosis of this disease has been difficult, and one problem confronting the investigators is to find a technic making the diagnosis less difficult.

Considerable experimental work has been necessary to an understanding of epizootic fox encephalitis. Close to 400 animals have been used in transmission experiments, and approximately 1,400 sick animals have been carefully studied. Thus far it appears that two diseases of foxes have been encountered, and the group of investigators is not sure that a third may be discovered as the work goes on.

Of 2,112 cities having milk ordinances, 1,557 require the tuberculin test annually for all cows supplying milk, and 555 additional require the test for raw milk but permit pasteurized milk to be sold from untested cows.

In 1918 the average yearly consumption of milk per inhabitant in the United States, was 171 quarts. By 1927 the average amount was 221 quarts, an increase of 28 per cent. This increase is believed to be largely due to the greater confidence in the wholesomeness of milk from tuberculin tested cows.

The average daily consumption of milk in Chicago has increased 15% since the requirement that all milk sold in the city must come from tuberculin tested cows was put into effect April 1, 1927. The daily consumption of milk in Chicago now amounts to 1,500,000 quarts.

In the last six months of 1927 about 262,000 cattle, mostly dairy cattle, were moved interstate after passing a successful tuberculin test. The test, however, detected 1,600 reactors, and these were prevented from moving interstate to mingle with healthy cattle and spread the disease.

YOUR DOG AND MINE*

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Rabies

Rabies, or as it is commonly called, hydrophobia, is one of the oldest known diseases of animals. It is primarily a disease of dogs, but many, possibly all, warm blooded animals and human beings are susceptible to it. It is frequently seen in horses, cattle and swine, always as a result of being bitten by a rabid dog, or other affected animal. Among wild animals it occurs rather frequently in wolves, coyotes, foxes and jackals, and rats. The cat family both wild and domesticated furnishes an occasional victim.

An attack of rabies is almost always fatal. Most authorities hold that no cases due to natural infection ever recover. It causes one of the most painful and agonizing of deaths and is the most dreaded of diseases. It is preventable by the Pasteur treatment in a very large percentage of the cases of infection. Of the important diseases of domesticated animals, rabies is the one most easily eradicated from a country.

Rabies was eradicated from Great Britain more than twenty years ago, by the simple expedient of muzzling all dogs in the islands for a period. It was kept out of the country for years thereafter by maintaining a six-months quarantine on imported dogs and foxes. It has been twice reintroduced since the world war by dogs surreptitiously brought in, in one instance in an airplane, in violation of the quarantine law. The disease was promptly eradicated on both occasions. No case of rabies has occurred in Ireland within 20 years, nor in Norway within 40 years. No case has ever occurred in Australia.

Rabies occurs in all parts of the United States. It is increasing in frequency in many states and probably losing ground in none. It is prone to increase in frequency in a certain area for several years and then suddenly become alarmingly prevalent, until control measures have checked it. This occurred in the eastern half of Iowa in 1925. So many cases occurred in that section within a short time, that many became greatly concerned about it and the news of the disease was given hundreds of columns in the newspapers. The education of the public and the enforcement of control measures (muzzling and quarantine laws and preventive treatment) effectively checked it.

There are a number of popular fallacies concerning this disease that are widely current. One of these fallacies is the belief that rabies occurs only or most frequently in midsummer, that is in "dog days." The disease shows no seasonable preference but more recorded cases have occurred in early spring than at other times. Another is that thirst will cause it. Rabies is an infectious disease just as small pox or diphtheria are. It is caused by infection from an animal having the disease, and in no other way.

Another fallacy is the belief that a rabid animal fears water and will be thrown into convulsions (fits) if water be brought into its presence. Such is not the case. The belief of many that every dog that acts strangely on the street is a "mad dog" is almost equally fallacious. Rabid dogs are seldom detected by a mob. The belief of not a few that if a dog bites

* The articles under this head are part of a series of fifty-two discussions written by the editor of VETERINARY MEDICINE and distributed by a newspaper syndicate organization to various daily newspapers for use in their Saturday editions each week. Although written exclusively for lay readers they are offered here, with permission of the syndicate, for such suggestions as they may contain, for the veterinarian who desires to instruct his clients in the care of their dogs, with a view to increasing the popularity of this animal among those whom he serves. Where some repetition is noted, it should be remembered that the articles were published separately at weekly intervals and it was necessary that each be in a measure complete.

one and at any time thereafter contracts rabies, the one bitten is endangered is, of course, an absurdity. A dog cannot transmit rabies by its bite unless it has rabies at the time it does the biting.

If bitten by a dog, do not become panic stricken over the fear of rabies. The chances are many to one, the dog does not have the disease and therefore cannot transmit it. If the dog does have rabies, the chances are about two to one that you won't be infected and if you are infected, there is a treatment that almost never fails to prevent the disease if commenced within a few days, say five to eight days after the infective bite. Don't kill the dog if it is at all possible to confine him for observation and thus arrive at a diagnosis of what ails him.

Symptoms of Rabies—I

Rabies or hydrophobia was described accurately by Aristotle in 333 B. C. in a manuscript still extant. It was the first disease of animals ever described by an English writer—Bartholomew Glanville, a Franciscan Friar who about 1250 wrote the following description of an animal suffering from this disease.

"Other hounds flee and avoid the wood hound [rabid dog] as pestilence and venom, and he is always exiled as it were an outlaw, and goeth along and rolling as a drunken beast, and runneth yawning and his tongue hangeth out, and his mouth drivelleth and foameth, and his eyes be overturned and reared, and his ears lie backward, and his tail is wrinkled [drooped] by the legs and thighs; and though his eyes be open yet he stumbleth and spurneth against everything and barketh at his own shadow" [i. e. without cause].

The foregoing is a good picture of a rabid dog, remarkably clear when compared with the description of other diseases of animals by English authors written as much as 500 years later.

Rabies is purely a disease of the nervous system and like all nerve diseases displays a variety of symptoms; some of them directly opposite to others.

In the typical case of rabies there is first uneasiness, then restlessness, then frenzy, followed by delirium, stupor, paralysis and death. The stages of excitement may pass very quickly and even be unobserved and the stupor and paralytic stages may be prolonged. Such cases are called dumb rabies. In other cases, the frenzy may be the principal stage and such cases are called furious rabies. It is this type that is responsible for the French name of the disease—rage, and for the term "mad dog." Every gradation between the furious type and the dumb type of rabies occurs.

The popular belief that a "mad dog" is occupied chiefly in having convulsions (fits) and foaming at the mouth is erroneous. There are many things that will cause convulsions in dogs, while on the other hand, convulsions are not a particularly prominent symptom of rabies and seldom occurs except in the stage of delirium. Since the muscles that hold the mouth shut are early in the disease affected to some extent by paralysis, the mouth is held slightly open and saliva drools constantly; rarely, however, except during convulsions is this saliva mixed with air sufficiently to make foam or froth and then usually not to a conspicuously noticeable extent.

An attack of furious rabies ordinarily lasts four to six days; and an attack of dumb rabies two to four days. Both end in the death of the animal.

The best way of ascertaining if a dog has rabies is to put him in charge of a skilled veterinarian, who after observing the case for a period of twenty-four hours or less, ordinarily can make a definite and accurate diagnosis. If, unfortunately, the dog is killed before a diagnosis is made, the head should be sent to a pathology laboratory for microscopic examination of the brain.

Reviews and Abstracts

Yeast a Black Tongue Preventive and Cure

In two recent reports [1, 2] Goldberger and associates give a further record of the pellagra investigations that have been carried on by the U. S. Public Health Service since 1914, and mention of which has heretofore appeared in these pages.[3, 4, 5] Both of the present reports deal exclusively with dietary investigations in the dog and are of the greatest importance to veterinarians.

So far as may be determined from their experiments, and they seem conclusive, black tongue of dogs, Stuttgart disease or canine typhus, is purely a deficiency disease, which of course has been the general view of veterinarians for some years, and is preventable, as has been reported heretofore in these pages, by administering two grams of brewer's yeast per kilogram of body weight.

It was further found that early in the attack and even in well developed cases, this or a somewhat larger amount of yeast administered in capsules to the dog brought about an immediate improvement and rapid recovery of the patient.

So far as the investigators were able to determine from their research, Stuttgart's disease (black tongue) of dogs is analogous to pellagra in man and the preventive property in yeast is identical for both conditions. This black tongue preventive property of dried brewer's yeast was not affected by heating in an autoclave under 15 pounds steam pressure for periods up to seven and one-half hours, but was destroyed by heating the yeast till it was charred. An acidulated water extract of the yeast contained all or nearly all the preventive property. In view of the seeming identity of the black tongue preventive and the pellagra preventive, the authors suggest that the former be designated as vitamin P-P. This being the designation of the thermostable substance of Smith and Hendrick which prevents pellagra. It differs from any other known dietary essential.

The following diet for dogs was found in a large number of experiments to be 100 per cent effective in producing black tongue:

Corn meal, 400 grams
Cowpeas, 50 grams
Casein (purified), 60 grams
Sucrose, 32 grams
Cottonseed oil, 30 grams
Cod-liver oil, 15 grams
Sodium chlorid, 10 grams
Calcium carbonate, 3 grams.

When yeast to the amount of 12 gm. daily for a 12 pound dog was added to the regimen, this diet not only did not induce black tongue but stopped the course of the disease and brought about prompt recovery.

Black tongue supervened when the foregoing diet (without the yeast) was fed after periods varying from 40 to 60 days. In one instance out of 33 in 128 days.

It is too early to predict how far reaching the facts discovered by Goldberger and his associates may be in the matter of dietetics in dogs. Veterinarians are a unit in recommending meat for the feed of dogs. It is customary to say "any diet consisting of 90 per cent meat is a good one," or "a dog's diet is good just to the extent that it contains meat." Not only has Stuttgart's disease or black tongue been looked upon as being a meat deficiency disease, but rickets and, rather generally, fright disease, have been placed in the same category.

[1] Experimental Black Tongue of Dogs and Its Relation to Pellagra, by Joseph Goldberger and G. A. Wheeler, Public Health Reports, Vol. 43, No. 4, January 27, 1928.

[2] A Further Study of Experimental Black Tongue with Special Reference to the Black Tongue Preventive in Yeast, by Joseph Goldberger, G. A. Wheeler, R. D. Lillie and L. M. Rogers, Public Health Reports, Vol. 4, No. 12, March 23, 1928.

[3] A case of Black Tongue with Postmortem Findings, by Jas. Goldberger, W. F. Tanner and E. B. Saye. Veterinary Medicine, Vol. XIX, No. 2, February 1924, p. 133.

[4] Yeast in the Treatment of Black Tongue, Veterinary Medicine, Vol. XX, No. 7, July 1925, p. 289.

[5] Is Black Tongue of Dogs Identical with Pellegra of Man, Veterinary Medicine, Vol. XXI, No. 4, April 1926, p. 155.

In the cases of black tongue produced experimentally by Chittenden and Underhill, not all exhibited the symptoms ordinarily associated with Stuttgart's disease. Some as far as may be determined from the rather meagre report were typical cases of fright disease.

Distemper has been looked upon as far more severe and far oftener fatal in dogs whose diet has contained insufficient meat than in those properly fed. Yeast, an inexpensive and readily obtainable item, may be found a serviceable substitute for meat in the prevention of nutritional ailments other than black tongue, and, of course, it may not. The dog is preeminently carnivorous; the degree to which vegetable substances can be substituted in his diet for flesh or food products of animal origin has not yet been determined. This much is sure, the conditions under which the dog is kept in our cities contrast so strongly with natural conditions for that animal that he is a great sufferer from ailments of dietary origin.

This work of Goldberger and his associates in the U. S. Public Health Service is highly creditable and the veterinary profession owes them a debt of gratitude for thus elaborating and supporting by experimental evidence a number of beliefs that heretofore have rested on clinical observation alone. It appears to the writer more credit might with justice have been given to others in this investigation. One can but assume from reading the reports that Goldberger and associates regard the fact that the dog is subject to a disease analogous to pellagra in man as being their discovery, as is also the fact that this pellagra-like disease in dogs is identical with black tongue, Stuttgart's disease or canine typhus. Further, that theirs is the discovery that black tongue is not infectious. They find "American literature on the postmortem findings is extremely meagre," and in giving the symptoms of the disease, quote from their own publication, although equally good descriptions occur in standard veterinary texts, with the single exception that they report an exanthema on the scrotum as one of the symptoms of black tongue but state that it is not always present.

The following references to reports published in VETERINARY MEDICINE support the foregoing statement:

Edgar Heiny reported black tongue as not infectious, October, 1911, page 790. L. F. Koonce, December, 1911, page 851, reported the disease as not communicable; one attack gives no immunity to further attacks; raw meat constitutes an effective treatment; inoculation experiments were negative. Doctor Koonce does not say in so many words that black tongue is a dietary disease but it is reasonably inferred from his report that he so regarded it.

John A. Davis, March 1912, page 116, stresses stiffness as a symptom and mentioned the use of dyphtheria antitoxin (an animal product) as being curative. John M. Kerr, Paris, Texas, December 1914, page 898, pointed out that black tongue is identical to European canine typhus. T. N. Spencer, April 1916, page 325, was positive that black tongue in dogs is identical to pellagra in man and reported having cured every case treated with milk, eggs and raw meat. The inference that the disease is dietetic and not infectious is unmistakable.

G. W. Browning, February 1917, page 113, states positively that black tongue is not infectious and that it may be cured with milk and beef broth. C. C. Stallworth, May 1923, page 435, recommends forced feeding with salmon, milk, broth and raw meat.

Black tongue has been recognized for 50 years. One of the early synonyms for the disease, "corn bread disease," indicates that its dietary origin was at least suspected many years ago. K. W. Franks has pointed out that the disease is seen only in the summer and that its absence in the winter was due to the fact that dogs could obtain fresh meat at that season. He states that it did not appear in Louisiana until forests were cleared and game was no longer available as a food for dogs. He recommends as a treatment milk, hamburger steak, raw eggs, sardines and salmon, and states that it never occurs in dogs 90 per cent of whose diet consists of meat.

To sum up, one can but say that years before the splendid research of Golberger and associates was undertaken, American veterinarians recognized black tongue, Stuttgart's disease, canine typhus, "corn bread disease," sore mouth, etc., as a single ailment; that it was regarded as noninfectious; that years before vitamins were heard of, this ailment was regarded as being due to an insufficient amount of meat in the diet. That all of these beliefs have now been scientifically confirmed by Goldberger and his associates is a matter of great satisfaction to all veterinarians, and will no doubt contribute to the wider use of preventive measures and a more intelligently directed and more effective treatment.

Milk Sanitation

The Health Section of the League of Nations has issued a bulletin[6] that will prove very interesting and useful to veterinarians engaged in milk inspection, and particularly to veterinarians who are endeavoring to induce their municipalities to inaugurate an adequate inspection of the milk supply and the dairies from which it is obtained.

Dairying is the most important industry in Denmark. The exports of dairy products alone from Denmark aggregate $200,000,000 a year and constitute one-third of the value of all exports of the country. The dairy industry is very highly developed and the supervision of the sale of milk in cities is very comprehensive. The sanitary regulations that have been adopted for dairies supplying Copenhagen will prove a valuable guide to those preparing regulations for American cities.

All matters concerning the feeding and stabling of the cows, the milking and handling of the milk, and the inspections seem to be adequately covered in the regulations for Copenhagen, except for the elimination of tuberculosis.

In the matter of handling the tuberculosis problem, Denmark and Copenhagen are behind most American cities. Pasteurization is not largely employed in Denmark and after all, as has been shown repeatedly in this country, pasteurization must be depended upon primarily for the prevention of milk-borne epidemics of typhoid fever, septic sore throat, diphtheria, scarlet fever and perhaps some other ailments, as well as to prevent transmission of tuberculosis, where the tuberculin test is not relied upon, undulant fever and some other diseases from cattle to man.

The milk supply for Copenhagen is derived from about 3,400 farms and an aggregate of about 54,000 cows; the sale of milk being 280,000 liters daily or about one-sixth the amount consumed in Chicago.

But two kinds of milk are provided for; one, "milk for infants" which must come from tuberculin tested cows and in the main corresponds to "certified milk" in American cities, and two, market milk for which cows need not be tuberculin tested. The amount of "milk for infants," like the amount of certified milk in America, constitutes but a small percentage of the total supply and it follows, of course, that the children in Denmark, like the children in American cities, are in the main supplied with market milk.

Bovine tuberculosis is very prevalent in Denmark. Of 163,000 cattle slaughtered, tuberculosis lesions were found in 28.85 per cent. Tuberculosis animals are removed only by physical inspection from the dairy herds supplying market milk; but the monthly physical examination of the cows by veterinarians is apparently very carefully made.

From the 54,000 cows supplying Copenhagen during 1924, 7 cases of tuberculosis of the udder and 152 cases of tuberculosis of other organs were removed. In addition to this, 42 cases of suspected tuberculosis of the udder and 66 other cases of suspected tuberculosis were removed. However, it is for the removal of ailments other than tuberculosis that the physical

[6] The Supervision of the Sale of Milk in Copenhagen, by St. Friis, Chief Sanitary Veterinary Surgeon; Extract from the document C.H. / E.P.S. / 49 (a) published by the Health Organization of the League of Nations—"Health Organization in Denmark" (Supplement to document C.H. / E.P.S. / 49).

examination is chiefly valuable. During 1924, 12,314 cases of diseases of the udder and 2,251 other diseases were removed from the dairies as a result of the monthly veterinary examination. This makes a total of 14,854 cows removed from the dairies during the year because of disease. As this constitutes more than 25 per cent of the total number of cows in the dairies, it is inferred that it includes many duplications; that is, cows that were removed for a temporary period and again restored, and later taken out, possibly in some instances a number of times.

Denmark has been endeavoring for thirty years to handle the bovine tuberculosis problem by the Bang method, and almost no progress has been made. Prof. Bang states that tuberculosis is as prevalent in Denmark now as it was 25 years ago. Of 750,000 cattle owned by members of the dairy associations, less than 48,000 in the whole country were tested in a year. This is fewer than are tested in the United States in two days, and since a conservative estimate would place the number of dairy cows infected as 30 per cent, and only about one-third of the milk is pasteurized, it follows that the ordinary market milk of Denmark is largely contaminated with tuberculosis organisms.

To summarize, it may be said that the market milk of Copenhagen is produced under first class sanitary supervision with respect to feed, stabling of the cows, physical examination and care of the milk; but lacking the requirement of the tuberculin test and of pasteurization, the milk is inferior from the point of wholesomeness to that of most American cities.

A striking fact is that "milk for infants" which corresponds in general to our "certified milk," costs only 2 to 3c per quart more than market milk. However, either the demand must be small for such milk or the cost of producing it is out of proportion to the price received, since only 3 per cent of the milk sold in Copenhagen falls within this class.

The bulletins afford strong support for the plan of requiring monthly physical examinations of cows supplying milk for cities.

Enforcement of Milk Inspection Ordinances

There are probably about 150 court decisions on the various phases of milk control.[7] Of this number of decisions only six have been found dealing directly with the subject of Pasteurization. In all but one of these cases ordinances or regulations requiring Pasteurization have been sustained.

The first decision on Pasteurization came in 1914, when the Supreme Court of Illinois upheld as valid an ordinance of the city of Chicago, which required continuous Pasteurizing machines to be equipped with apparatus so that records would be kept in a locked chamber under the control of the commissioner of health. The power of the city to require Pasteurization was not questioned, but the stipulation of a certain type of apparatus was challenged as unreasonable. On this point the court said:

The city having power to require milk to be pasteurized is not limited to the imposition of a penalty for a violation of this requirement, but may prescribe the conditions under which the pasteurization shall be done in order to prevent an evasion of the ordinance and insure that the product shall be such as the ordinance requires.

Another municipal ordinance requiring Pasteurization was sustained in 1920, when the second case on this subject was decided by the Supreme Court of Wisconsin. In one respect this case is even stronger than the first, for the court actually took judicial notice of the facts that milk is easily infected with germs, is unsuitable for human consumption when so infected, and that Pasteurization for 30 minutes at 145° F. destroys all germs of disease.

In this case, an ordinance of the city of Milwaukee required that all milk sold

[7] Court Decisions on Pasteurization, by James A. Tobey, Public Health Reports, Vol. 42, No. 27, June 1, 1927.

therein, except certified milk and inspected (tuberculin tested) milk, be Pasteurized by either the holding or flash system, the conditions for each being set forth.

Shortly after this Wisconsin decision, the regulations of local boards of health, adopted in conformity to state law, were sustained in two New York cases. In one instance a health regulation of the City of Poughkeepsie in effect prohibited the sale therein of any milk, except that designated grade A raw and certified milk, unless Pasteurized; while in the other cases, a health regulation of the city of Lockport went even farther and debarred all milk except "certified, grade A raw and grade A Pasteurized."

The fifth and last decision upholding Pasteurization is a brief North Carolina one, handed down in 1924. The town of Tarboro in that State passed an ordinance to the effect that, after a certain date, it would be unlawful for any milk or cream to be sold for human consumption in Tarboro unless Pasteurized. The ordinance also required all milk sellers to secure a permit from the county health officer. Both of these provisions were pronounced valid by the supreme court.

The latest, and most destructive of the decisions, and one which is directly contrary to all of the others is a Missouri case, decided in 1926, in which the court reached the conclusion from the evidence offered, that raw milk, as a general thing, was a better food than Pasteurized milk, and that it was unreasonable to require milk in St. Louis to be Pasteurized. The cause of safe milk in that state is definitely retarded by this decision, because, of course, from a scientific standpoint, raw milk is not a better food than Pasteurized milk.

Legally there is justification for this particular decision. In the first place, the ordinance in question was defectively worded, and, in the second place, a reading of the opinion indicates that the arguments in favor of Pasteurization might have been much more effectively presented.

Under authorization of state law St. Louis had enacted an ordinance that purported to require all milk not certified to be pasteurized. The printed ordinance as presented to the court was a jumble of words, with a sentence or more omitted, and the court properly said that it was difficult to attach any meaning to it.

Education of the public to demand pasteurized milk is about the only remedy left in St. Louis, though when the inevitable milk-borne epidemic occurs, and experience has often demonstrated that it will eventually occur among the users of a raw-milk supply, Pasteurization will no doubt be adopted there.

The great weight of legal authority is, as shown by the court decisions outlined, to the effect that the requirement that milk shall be Pasteurized in accordance with standards set by health authorities is reasonable and well calculated to protect the public health. This is the general rule of law, a rule which, apparently does not apply in Missouri at present.

Milk is the most important of the foods of man, and it is entirely proper that every possible sanitary safeguard should be employed in the endeavor to secure a pure supply. In putting into effect provisions for the safety of milk, the fact that those who produce or distribute milk are inconvenienced thereby does not render the regulations invalid, for the welfare of the whole is of more importance than the convenience of a few.

Importance of Sanitary Control of Milk Production and Distribution

Milk is second in importance only to water as a vehicle of disease transmission. A public water supply unquestionably reaches a larger percentage of the people than any other single potential disease vehicle; but milk falls a close second. As a city grows larger, its milk supplies tend to merge more and more until finally hundreds of thousands of

people are supplied from one plant. It is easy to understand therefore, how the milk supply of a city unless properly controlled, may be the vehicle for outbreaks of disease and particularly is this so in the case of certain disease producing bacteria for which milk is a natural growing medium.

The frequency of milk-borne outbreaks of disease is well known. John W. Trask of the U. S. Public Health Service, compiled a list of 500 outbreaks of milk-borne diseases occurring in the 27-year period 1880 to 1907. Of these outbreaks, 317 were of typhoid fever, 125 scarlet fever, 51 diphtheria and 7 septic sore throat.

Since 1907 a large number of cities have adopted milk ordinances that to a greater or less degree protect the residents from milk-borne epidemics. Nevertheless, such outbreaks of disease still occur. In statistics collected by the U. S. Public Health Service for the six-year period 1917 to 1923, it is shown that at that time milk-borne epidemics were still occurring in the United States at the rate of more than 8 a year. Although great strides have been made in milk sanitation by many of the larger cities, a great majority of the smaller cities are still experiencing an unnecessarily high rate of milk-borne epidemics. The occurrence of the milk-borne outbreak of typhoid fever in Montreal in 1927 is still fresh in memory. This outbreak, the worst in history, cost more than 500 lives and many millions of dollars expense. It was due to inadequate supervision of the milk supply by the Health Department and to inefficient pasteurization or an entire lack of pasteurization by a single milk supply company of Montreal over a period of many weeks.

In 1924 the U. S. Public Health Service undertook a cooperative program with Alabama[8] to improve the sanitary control of the milk supply of various cities in the state. The first step was the adoption of what was termed a "standard milk ordinance." The provisions of this standard ordinance were published in VETERINARY MEDICINE at the time. It has undergone some revision since and is being subjected to careful study by a number of organizations including representatives of the American Veterinary Medical Association during the present summer, with a view to bringing it up to date and making it more effective.

In a recent publication of the Public Health Service,[9] a report is given on the working of this ordinance in 14 towns in Alabama having a total population of slightly over 200,000. The report is a long one and is available for all who wish to study it in detail. Briefly, it may be said that the milk in all of these 14 communities grades very much higher now than at the time the ordinance was enacted as do the dairies and the conditions under which the milk is handled. The score of the milk supply of these cities as made by the U. S. Public Health Service has increased from 43% when the ordinances were adopted to 94% at the present time.

An effect of these milk ordinances of importance to the dairy industry and to veterinarians has been the increase in the amount of milk used that has been a result of increased confidence in its wholesomeness. The increased consumption of milk in these 14 towns amounted to 90% within two years after the ordinances were adopted.

This increase in milk consumption has been invariably the result wherever official steps have been taken to improve the public milk supply. It has been noted again and again even the tuberculin testing of cows has resulted in an increased milk consumption wherever it has been carried out extensively.

Frequently one of the obstacles to be overcome in inducing a municipality to adopt adequate sanitary control of its milk supply is the objection of the milk producers and distributors. This objec-

[8] A State Wide Milk Sanitation Program by Leslie C. Frank; Public Health Reports, Vol. 39, No. 45, November 7, 1924.

[9] Standard Milk Ordinance Results in 14 Alabama Towns, by Leslie C. Frank; Public Health Reports, Vol. 42, No. 10, March 11, 1927.

tion, of course, is always based upon the assumption that the proposed milk ordinance will hurt business and arises solely from a lack of information.

Veterinarians endeavoring to induce their cities to adopt milk ordinances should fortify themselves with statistics in the matter of the increased consumption of milk that will invariably result from a greater public confidence in its wholesomeness and thus in the beginning, enlist the aid of the milk producers and distributors instead of having to overcome their objections when it is proposed to enact the ordinance.

One may still see in British veterinary publications frequent statements that the eradication of tuberculosis from Great Britain by the method employed in the United States, is impractical because it will result in a milk famine. Experience has repeatedly shown that no such result need be expected or would occur. The eradication of tuberculosis in any considerable area in the United States has unfailingly resulted in an increased production of milk in that area. It should be remembered that the removal of any considerable number of animals from an area does not occur all at once, and furthermore that on the average, the tuberculous animals are the less productive and the less profitable animals in the herds.

For example, if 25% of the dairy animals in a given district were tuberculous, it does not mean that such animals produced 25% of the milk for the district. Furthermore, they will not all be removed at once, and as infected animals are taken from the herds, their places are supplied with healthy animals by purchase from other districts and by rearing calves, so that the number of cows is not materially reduced at any time, and experience has shown that by the time the eradication of the disease is complete or very shortly thereafter, the milk production in the area will have very considerably increased, the demand for milk will have increased, and the profit to the dairyman will have increased even more.

Medicine Administered Via Nasal Chamber in Swine

Vajda[10] of Budapest describes, in an extended article illustrated with a number of anatomical drawings, what he regards as a great improvement over oral administration of liquids to swine. His method is to inject the liquid into the nostril in quantities of about 5cc at intervals of three or four seconds. In this way, he has given quantities up to two ounces in the time required to properly restrain the animal for oral administration; while quantities of medicament up to 10 or 20cc are given in less time and with much less effort and hazard that they can be given by the mouth.

The animal is restrained, unless too large, by sitting it on its haunches between the legs of an assistant. It is grasped about the muzzle and the mouth held shut with the head in a horizontal position. The injection is made with a 10cc hypodermic syringe without the needle. The nozzle of the syringe being inserted into the nostril and pressed close against the septum. Injected in quantities up to 5cc the medicament very readily finds its way to the esophagus and is swallowed without strangling the animal or arousing its resistance.

Doctor Vajda has used this in practice only for the administration of oily medicaments. He has experimentally given watery solutions, magnesium sulphate solution, a few times without difficulty but he would not recommend the method for the administration of watery solutions without further trial. However, he regards it as being probably as suitable for watery solutions as for oily liquids.

Advantages of the method are the animal is prevented from squealing; there is less tendency to struggle than when restrained otherwise; it is not strangled as frequently occurs when liquids are injected into the mouth; no part of the medicine is lost; and animals can be dosed with fair rapidity. With a second assis-

[10] Die Verabreichung flüssiger Medikamente durch das Maul und die Einspritzung derselben durch die Nase bei Schweinen, by Dr. Theodor Vajda, Budapest; Tierärztliche Rundschau, Berlin, May 13, 1928.

tant and a number of syringes. Doctor Vajda has dosed as many as 60 animals an hour, and regards it as a superior method where accuracy in determining the amount of medicament given the animal is desirable.

Rabies on the Increase

"Rabies deserves to be considered one of the most important public health problems. The number of deaths is not appalling, but the suffering and fear caused by it are so great as to make this one of the most dreaded of all diseases," say Rice and Beatty,[11] who have made an effort to ascertain the present prevalence of rabies in the United States and elsewhere. They find rabies on the general increase in all parts of the United States, with irregular outbreaks in an epizootic form occurring at more and more frequent intervals.

Prior to 1908, the Western states were practically free of rabies, yet it is prevalent throughout this section now, and there have been more deaths (human) from rabies in recent years in California than in any other state (69 deaths since 1909).

It is a sad commentary on the efficiency of our public health forces who have been instrumental in halving the death rate from tuberculosis within a generation and in all but eliminating typhoid fever from the larger cities; and who have so largely reduced the prevalence of many other contagious diseases, that with rabies, one of the most easily controlled and easily eradicated of all infectious diseases, they should be losing the battle steadily.

Nor is the paradox any less striking in the case of the forces engaged in live stock sanitation—forces that have repeatedly eradicated foot and mouth disease, the most contagious disease of either animals or man, that have brought hog cholera and anthrax under control and banished glanders; against the most easily controlled and easily eradicated disease of animals, they too are losing the battle year by year.

In Canada to the north of us, rabies is rare, having existed within recent years only in Quebec and Ontario, unless reports of Arctic explorers that rabies is epizootic among wolves within the Arctic Circle, are accepted and in this there is some question as to the accuracy of the diagnosis. In Mexico exact information is not available, but there are many Pasteur institutes and thousands of anti-rabic treatments are given annually. The disease is believed to be common there. In parts of South America rabies is rather prevalent and is believed to be increasing. In great areas it is unknown.

In Europe the picture is a more hopeful one. Ireland has had no rabies within 20 years; nor has England, except for its surreptitious introduction on two occasions when it was promptly eradicated. Rabies is rare in Switzerland and there have been no cases in Sweden within 40 years. In Germany the rabies situation was well in hand before the war, there being an average of 300 to 400 cases in animals annually. The number increased annually from the beginning of the war, until 1924 when 2,699 cases in animals were reported. Since that date, conditions have improved greatly. In 1924 there were 48 human deaths, in 1925, 20, and in 1926, 22. The persons bitten by rabid dogs for those years were 2,417, 1,159, and 579 respectively.

As is well known, rabies was very prevalent in France in the time of Pasteur, but by 1913 the situation was well in hand. During the war it increased to alarming proportions, but at present is declining.

Rabies is epizootic in Austria and prevalent in Italy, Spain and Portugal. Nothing is known of its prevalence in Russia but the condition is believed to be more serious there than elsewhere in Europe.

The disease is widely prevalent in parts of Africa and unknown in other sections. It has never occurred in Australia.

In many parts of Asia rabies is very prevalent, including Siberia, Japan, China and India. In the Province of Bengal alone it

[11] The Prevalence of Rabies in the United States and the World, by Thurman B. Rice, M. D., and Norman Beatty, M. D.; American Journal of Public Health, April 1928, reprinted in the Veterinary Bulletin, Vol. 21, No. 5.

was reported there were 304 human deaths from rabies in 1925. The Pasteur Institute of Calcutta treated 5,585 cases in 1925, of whom 33 died.

Screw-worm Larvae in Milk

Wharton[12] reports a trip to a dairy farm in company with Dr. J. A. Phillips, city veterinarian of Houston, Texas, to investigate a complaint that the milk at the farm contained small white worms.

A half dozen cows were found ticky as usual, running in the pasture during the day and being corralled during the night. Their calves were allowed to suck a part of the milk at each milking.

When milk was drawn from these cows and strained, Doctor Wharton found it to contain considerable numbers of small white worms. The utensils had been scoured and sunned and were clean, and it was obvious that the worms had come from the udder in the milk.

Upon examination, it was decided that the worms were larvae of screw-worm fly, *Chrysomia macellaria,* and it was decided that the eggs must have been deposited on the ends of the teats while they were still covered with moist saliva following sucking.

The report does not state how the larvae were identified. The account is more indicative of flesh fly larvae, *Sarcophaga sarraceniae,* than of the screw worm, it being the habit of the screw worm to lay its eggs where there is fresh blood or a sanguineous or even a serous discharge from a wound. The flesh fly on the other hand, deposits living larvae on the flesh when the conditions are favorable to it. The teats would dry so quickly after suckling that it would appear doubtful that screw worm eggs would have an opportunity to hatch and the larvae to crawl into the teat orifice. On the other hand, the flesh fly larvae deposited alive, could probably effect an entrance into the teat before drying limited their activity.

[12] Screw-Worm Larvae in Milk, by A. E. Wharton in a leaflet issued by the Texas Agricultural Experiment Station.

Opsonic Index Determinations in Acariasis

Horneck,[13] in an article on the treatment of scabies stresses the importance of the physical condition of the animals and states that the opsonic index of animals under treatment ought to be established at the earliest date possible so as to judge as to whether or not the animal's resistance is sufficient to justify treatment.

The author made some valuable experiments to determine the penetrating qualities of a number of drugs employed in the treatment of mange in dogs. He found that mange parasites are often found upon animals that show no clinical symptoms of the ailment. Under such conditions, the parasites become pathogenic only if the animal's resistance is lowered through accident, disease or other unfavorable conditions.

It is well recognized that mange in hogs is subject to the same conditions; that is, that clinical cases rarely develop in animals that are well cared for, and in vigorous health, although the parasites may exist on these animals in considerable numbers.

Demodicosis in Cattle

LeCoultre[14] describes this condition in an article of interest. The case was found during a routine examination of animals convalescing from the "Bali epizootic." The clinical picture is described under the head, Demodex folliculorum, in the second volume of Hutyra & Marek, who state that it occurs enzootically in North America, Kenya Colony and Tanganyika, but that in Europe it appears very rarely. DeBlieck describes the disease in India.

The animal exhibited all over its body pustules and nodules ranging in size from a pea to a hazelnut. Here and there they were dried up and formed crusts. Conglom-

[13] Contributions to the Treatment of Acariasis by Dr. Karl Horneck, Frankfort, Germany; Therapeutische Monatshefte fur Veterinar Medizin, Vol. 1, No. 1. Translated by H. J. Magens, Kerrville, Texas.

[14] Demodicosis in Cattle at Bail, by A. P. LeCoultre, Government Veterinary Officer, Dutch East Indies; Therapeutische Monatshefte fur Veterinar Medizin, Vol. 1, No. 1. Translated by H. J. Magens, Kerrville, Texas

erations of pustules appeared upon the hind quarters, and neck and shoulders seemed just covered with them. There were no changes in the carpal and tarsal regions, nor on the tail.

Upon exerting pressure upon the pustules a small amount of cheesy pus issued from several small openings. In some instances no cheesy material but a harder substance was encountered. Some of the pustules contained pus which was not bloody. Microscopic examination showed *Demodex folliculorum.*

The insular laboratory later on classified the parasite as *Demodex phylloides.* Breedveld and Soos have described demodicosis of cattle in Sumatra and Java respectively.

(Note. This same condition occurs in cattle in the United States, affected animals having been identified in several of the corn belt states.—A. T. K.)

Ovarian Grafts Tame Cryptorchids

No precise answer can be found anywhere so far to the question whether the experiments of Steinach on rejuvenation of the organism can be used practically in veterinary science or not.

According to Steinach, a castrated male guinea pig will develop the characteristics of the females after implantation of parts of an ovary.

Experience has taught us that the notoriously vicious qualities of the stallion are accentuated in the cryptorchid and often to such an extent that such horses cannot be worked.

Pardubsky[15] observes that castration is rather a serious operation in the case of an abdominal cryptorchid, which not every veterinarian is willing to perform. Often climatic conditions, great heat for example, render the operation inadvisable just at the time when the animal is most needed for work. The author conceived the idea of abrogating the viciousness and substituting the feminine disposition by implantation of ovaries or segments into a cryptorchid stallion.

The first attempt at such implantation was made in 1922. The animal, which was an extremely vicious and dangerous one, could be curried ten days after the operation by anyone. Shortly thereafter it was removed from the locality and could not be observed further by the author.

In May, 1926, the author had an opportunity to perform a similar operation at the surgical clinic of the State Veterinary College at Brünn.

The owner brought to the clinic a very vicious cryptorchid stallion which could scarcely be managed at all. Due to the animal having been exposed to distemper and the extreme summer heat castration was deemed contraindicated, and ovarian implantation was decided upon.

On June 17, 1926, a mare intended for immediate slaughter was killed at the clinic and the abdominal cavity opened as soon as possible. The cryptorchid had already been anesthetized and prepared for the operation by having the whole anterior aspect of the pectoral region shaved and disinfected with tincture of iodin. The ovary was removed under sterile conditions and four pieces about an inch in length sliced from it. Simultaneously an incision of six centimeters long was made on each side of the stud's breast. The incisions were spread and the implantation made at the deepest part of the wound into the muscles. The other two ovarian sections were transplanted subcutaneously in the same region.

Three of the four implantations healed up by primary union. Seven days after the operation the animal left the clinic. Two months later the owner reported that the wounds had healed entirely within five days after he took the animal home, and that the animal could be handled easily at the time (two months after the operation). Five months later, i. e., seven months after the operation, the owner reported that the animal was still more quiet and tractable.

[15] Notes on the Implantation of Ovarian Segments in a Cryptorchid Stallion, from the Surgical Clinic of the State Veterinary College at Brünn, Czecho Slovakia, by Prof. Dr. K. Pardubsky. Prager Archiv fur Tiermedicin der deutschen Tierarzte, Vol. 7. Translated by H. J. Magens, Kerrville, Texas.

DE VINE VISITS TEXAS VETERINARIANS

The eighteenth annual meeting of the Texas Veterinary Medical Association was held in College Station, June 18-22. In connection with the usual post graduate work given to the members of the Association by the faculty, practicing veterinarians of the Association and outstanding lecturers were secured by the college for the program.

Dr. Mark Francis, Dean of Veterinary Science, assured the visiting body of their welcome and expressed confidence in the work being done by the veterinarians of Texas and of his great pleasure at the good attendance.

Dr. R. P. Marsteller, the untiring genius of the college who makes the wheels turn, who makes everybody comfortable and happy, and who is Professor in charge, held a clinic on Disease and Surgery of Horses and Mules. His work on Epidural Anesthesia, Sterility, Caudal Myotomy, Wound Treatment, Roaring, Lameness, Periodic Ophthalmia is notable and his clinic history making.

W. R. Sanderson, Secretary-Treasurer of the State Board of Veterinary Medical Examiners, spoke on Salivary Calculi.

The outstanding lecturer of the course was J. F. DeVine of Goshen, N. Y. Doctor DeVine lectured on Diseases of the Reproductive Organs of Cattle, Diseases of the Digestive Organs, and Diseases of Calves and Young Cattle. He also held a clinic on the Diseases and Surgery of Cattle, Diagnosis of Pregnancy and Treatment of Sterility. Dr. DeVine demonstrated to his delighted hearers a proper fundamental knowledge of his work and also a careful diagnostician and gave careful direction as to treatment.

In joint evening session with the Ladies' Auxiliary a very enjoyable program was carried out. Dr. R. P. Marsteller made a gracious address of welcome. Dr. A. E. Flowers of Dallas responded with his usual fund of facts and information on practical lines with the lighter vein interspersed throughout.

A paper by Mrs. U. E. Marney of San Antonio, President of the Ladies' Auxiliary, drew much applause and favorable comment. Mrs. Marney showed by able handling of her subject that the women of the profession are alive to their responsibility. Dr. M. E. Maier, retiring president of the Association, gave an interesting talk and expressed much appreciation for the cooperation of the Association.

Mrs. R. P. Marsteller, Secretary of loan fund of the A. V. M. A. Auxiliary, gave a report of the meeting in Philadelphia in 1927. A humorous paper called News of the Season was read by Mrs. W. R. Sanderson of Brownwood and was greatly enjoyed. Dr. DeVine of N. Y. closed the program with a much applauded speech to the ladies.

The Ladies Auxiliary elected new officers: President, Mrs. U. E. Marney, San Antonio; First Vice President, Mrs. R. P. Marsteller, College Station; Second Vice President, Mrs. C. R. Covington, San Antonio; Corresponding Secretary, Mrs. W. R. Sanderson, Brownwood; Secretary-Treasurer, Mrs. Dr. Pearce, Leonard.

Texas Veterinarians in Attendance at the Annual Meeting at College Station, June 18-22, 1928

Others who contributed to the program were: A. E. Wharton, Associate Professor Veterinary Pathology at the college, who spoke on the subject of the Veterinarian in Public Health. Administration of Intradermic Tuberculin and Interpretation of Reactions was discussed by Dr. Thomas O'Reilly, Bureau of Animal Industry, Fort Worth. Dr. T. O. Booth, Assistant Veterinarian and Laboratory Director Live Stock Sanitary Commission of Texas, told of Texas plan of Contagious Abortion Eradication. Dr. A. A. Lenert, Associate Professor Veterinary Medicine and Surgery, College Station, discussed Symptoms and Fright Disease of Dogs, Typus of Dogs, and Diseases and Surgery of small animals; also Anthelmintics for small Animals. Dr. V. A. Scott, John Tarleton Agricultural College, Stephenville, gave a number of case reports. What Tick Eradication means to the Live Stock Industry and the veterinarian was discussed by Dr. H. L. Darby, B. A. I.,

Fort Worth, in charge of Tick Eradication and Tuberculosis Eradication.

Dr. R. C. Dunn held a clinic on Poultry Diseases including: Contagious Epithelioma, Bacillary White Diarrhea, Fowl Typhoid, Internal Parasites, Coccidiosis, Botulism, Fowl Paralysis. Caponizing, Collecting Blood for Serological Tests, Methods of Adminisrtation of Medicine to Poultry, Post-mortem Technique.

Dr. J. D. Jones, Assistant Veterinarian, Texas Experiment Station, and H. O. Von Rosenberg, Assistant State Veterinarian, Live Stock Sanitary Commission, held a clinic on Diseases and Surgery of Sheep and Goats. The Association regrets very much to learn that Dr. J. D. Jones will soon leave the college to accept a position with the Pennsylvania Bureau of Animal Industry. His going will be a great loss to the state and to the college.

Dr. W. M. Smotherman, Veterinarian Penitentiary System, Huntsville, demonstrated the use of the emasculatome.

Other phases of the meeting were the advantage the veterinarians took of the opportunity to consult Faculty and Dr. DeVine on special lines of work. The course was voted more than good. The practicing veterinarians of the state were called upon and responded ably and gave valuable demonstrations. The program was largely in their hands and much credit is due them.

At the business session the following officers were elected: President, M. E. Gleason, San Antonio; First Vice President, Y. J. Aiken, Lubbock; Second Vice President, W. R. Hodges; Ranger; Secretary-Treasurer, D. Pearce, Leonard.

Leonard, Texas. D. Pearce, Secretary.

A POULTRY DISEASE PROGRAM

The regular quarterly meeting of the Hudson Valley Veterinary Medical Society was held at Catskill, N. Y., May 9th, 1928. After a fine luncheon attended by over thirty members, accompanied in many instances by their wives and other guests, the meeting convened at the well-equipped hospital of L. L. Parker, President McCartney presiding.

After a brief business meeting E. L. Brunett, of Ithaca, was introduced as the speaker of the day. He outlined the general symptoms and method of diagnosis of several important poultry diseases, including Bacillary White Diarrhea, Coccidiosis, Avian Tuberculosis, etc.; the method of injecting tuberculin and drawing blood specimens was demonstrated on living birds; the agglutination test was explained and the reading of results illustrated by specimen tests from Doctor Parker's laboratory. Many questions were asked relative to these diseases and various methods of treatment and control were discussed.

A considerable number of specimens of both live and dead birds were presented by veterinarians and others for examination. Numerous autopsies were held by Doctor Brunett and a considerable number of interesting conditions were shown. Intestinal parasites, including tape worms, round worms, etc., were the principal troubles found. In several instances microscopic examination was necessary to determine the specific causes of the pathological conditions found.

While the meeting was entirely devoted to poultry problems, the interest manifested by those present indicated that veterinarians are greatly concerned in this branch of the profession.

It was voted to hold the next quarterly meeting of this society at Kenozia Lake, August 8, 1928.

Albany, N. Y. J. G. Wills, Sec.-Treas.

OKLAHOMA VETERINARIANS HOLD SEMI-ANNUAL MEETING

The fourteenth semi-annual meeting of the Oklahoma Veterinary Medical Association was held at Stillwater, June 11-12, 1928. The president, Dr. George Pugh, of Lawton, presided and delivered the president's annual address.

C. C. Hisel, state veterinarian, reported the publication of the proceedings of the Tuberculosis Conference held in Oklahoma City, February 7-8, 1928.

On motion of Doctor Hisel a committee was appointed to draft uniform rules and regulations for the interstate shipment of poultry.

C. H. Kitselman, of Manhattan, Kansas, gave a very able lecture on the agglutination tests; later going to the laboratory and making a demonstration. Each member started a test.

After dinner all members went to the College Auditorium to a Lyceum number.

Beginning the second day's program, R. O. Whittenton, Professor of Zoology at the A. & M. College, gave a lecture on the classification and life cycle of parasites of domestic animals. After the lecture all went to the laboratory and observed the more common parasites under the microscope.

H. W. Orr gave a discussion on laboratory diagnosis of parasitisuas and a demonstration in the laboratory of parasite eggs under the microscope.

Doctor Hisel advised having a booth at the National Poultry Show at Ardmore. After a discussion the following committee was appointed to arrange the matter: Doctors Hisel, Orr, Harnden, Gerber and Walter.

C. H. Kitselman, of Manhattan, Kansas, presented in the laboratory the tubes for reading of the agglutination test that had been started the first day of the meeting, and answered many questions in a very able manner.

A paper on Common Parasites, Symptoms, Diagnosis and Treatment in Dogs and Cats was read by C. R. Walter, of Tulsa, which was very well received by all.

The committee on resolutions recommended raising the annual dues of the Association from $2.00 to $5.00 at our next annual meeting.

O. E. Robinson, of Bixby, read a paper on Common Parasites of Swine, Symptoms, Diagnosis and Treatment, which was illustrated by lantern slides.

Doctor Orr gave a paper on Parasites of Poultry, Symptoms, Diagnosis and Treatment.

Stillwater, Okla. Frank R. Knotts, Sec'y.

CHANGES IN ARMY VETERINARY SERVICE

Regular Army

Major Christian W. Greenlee is relieved from his present assignment as student at the Army Veterinary School, and directed to sail on or about Sept. 5, 1928, for the Philippine Department for duty.

Each of the following named officers is assigned to station indicated after his name, upon completion of his present tour of foreign service in the Philippine Department:

Lt. Colonel Burt English—to Fort Sill, Okla.

Major D. B. Leininger—to Fort Bliss, Tex.

Lt. Col. James R. Shand is relieved from duty at Fort Sill, Okla., and directed to proceed on or about Sept. 28, 1928, for the Philippine Dept. for duty.

Capt. Edward M. Curley is relieved from further assignment at Cornell University, and directed to proceed to Carlisle Barracks, Pa., for temporary duty for a period of approximately four months, and upon completion of this temporary duty to report to Brooklyn, New York, N. Y. G. I. D., for duty.

Capt. Geo. L. Caldwell is relieved from further assignment at the Cavalry School, Fort Riley, Ks., upon completion of his present course of instruction and will report to the Commandant, Army Veterinary School, Army Medical Center, Washington, D. C., for duty.

Each of the following named officers is assigned to duty at the Army Veterinary School, Washington, D. C., for the purpose of pursuing a course of instruction, being relieved from his present assignment and duties in time to proceed to San Francisco, Calif., to sail on transport scheduled to leave that port on or about August 10, 1928, for New York City:

Captain Fred C. Waters—Camp S. D. Little, Ariz.

Captain Philip H. Riedel—Fort Bliss, Texas.

Reserve Corps

New acceptances:

Barthelme, L. F., 2nd Lt., 1815 Washington Ave., Parsons, Ks.

Bruns, Van Leslie, 2nd Lt., Lake City, Fla.

Carlisle, Wm. M. C., 2nd Lt., Hickory, Pa.

Elliott, C. H., 2nd Lt., Yorkville, Ill.

Grace, Reginald L., 2nd Lt., Box 267, Norwich, N. Y.

Carroll, F. E., 2nd Lt., Fredericktown, Mo.

Dunlap, Glen L., 2nd Lt., 1126 Bluemont St., Manhattan, Ks.

Ehlers, Daniel P., 2nd Lt., 3927 So. 24th St., Omaha, Neb.

Elsea, Robert L., 2nd Lt., Sweet Springs, Mo.

Lauts, Albert E., 2nd Lt., Spencer, Neb.

McIlnay, John N., 2nd Lt., 1126 Bluemont St., Manhattan, Ks.

Newlin, Theo. A., 2nd Lt., Lewis, Ks.

Rose, V. T., 2nd Lt., Ionia, Ks.

Schmidt, Albert I., 2nd Lt., 37th & Leavenworth Rd., Kansas City, Ks.

Smith, L. H., 2nd Lt., Lebo, Ks.

Shoeman, John D., 2nd Lt., Waukee, Ia.

Spurlock, J. H., 2nd Lt., RFD No. 6, Osage City, Ks.

Andrews, Wm., 2nd Lt., 7 S. 9th St., Marshalltown, Ia.

Collins, Clay R., 2nd Lt., Tilden, Neb.

Criley, Ben R., 2nd Lt., Ottumwa, Ia.

Glascock, D. Wm., 2nd Lt., Audubon, Ia.

McNellis, R., 2nd Lt., Dunkerton, Ia.

Mayfield, O. J., 2nd Lt., Parnell, Mo.

Hilbert, K. F., 2nd Lt., Candor, N. Y.

Hopson, Geo. H., 2nd Lt., 131 Center St., Massena, N. Y.

Kelly, W. A., 2nd Lt., Lysander, N. Y.

MacKellar, R. S., Jr., 2nd Lt., 39 Charles St., New York, N. Y.

Poley, Philip, 2nd Lt., 1225 Seneca Ave., Bronx, N. Y.

Promotions:

Shigley, James Fremont, 118 S. Sparks St., State College, Pa., to 1st Lieut.

Harrison, Richard H., Jr., 806 N. Haskell St., Dallas, Tex., to Capt.

Pyle, Norman J., Amherst, Mass., to Capt.

Separations:

Scanlan, Wm. J., 1st Lt., ORC status terminated 2-24-28.

Bogue, Joseph A., 2nd Lt. Failed to accept reappointment.

Kirkwood, Glenn B., 2nd Lt. Failed to accept reappointment.

Sailor, Ernest S., 2nd Lt. Failed to accept reappointment.

Baker, Bennie J., 2nd Lt. Failed to accept reappointment.

Driver, Fred C., 1st Lt. Declined reappointment 6-4-28.

Lumby, Charles L., 2nd Lt. Died 3-9-27.

Sears, Kirtley, 1st Lt. ORC status terminated 3-31-28.

Veterinary Reserve Officers Ordered to Active Duty Training

Third Corp Area:

Captain Herbert Leonard Armstrong, 21½ Main St., Bel Air, Md., to Carlisle Barracks, Pa. July 8-21, 1928.

Captain James Jacob Jones, La Platta, Md., to Carlisle Barracks, Pa. July 8-21, 1928.

First Lieut. Andrew J. Sipos, State Office Bldg., Richmond, Va., to Carlisle Barracks, Pa. July 8-21, 1928.

First Lieut. Robert W. McKibben, 216 West 2nd St., Waynesboro, Pa., to Carlisle Barracks, Pa. July 8-21, 1928.

Sixth Corps Area:

Major James A. Weigan, Sun Prairie, Wis., to Camp McCoy, Sparta, Wis. July 8-21, 1928.

Major Willis A. Myers, Wenona, Ill., to Ft. Snelling, Minn. July 2-15, 1928.

Major Hayes B. Raffensberger, Miles City, Mont., to Ft. Snelling, Minn. July 2-15, 1928.

Major Warren J. Embree, 1800 Transportation Bldg., Chicago, Ill., to Ft. Sheridan, Ill. July 22-Aug. 4, 1928.

Captain Rollo S. Montgomery, Court House, Taylorville, Ill., to Ft. Sheridan, Ill. July 22-Aug. 4, 1928.

Captain Israel Wallman, 343 S. 55th Place, Chicago, Ill., to Ft. Sheridan, Illinois. July 8-21, 1928.

First Lieut. Joseph R. McIlree, Palmyra, Wis., to Ft. Sheridan, Ill. July 8-21, 1928.

First Lieut. Calvin A. Ward, 6754 Normal Ave., Chicago, Ill., to Ft. Sheridan, Ill. July 8-21, 1928.

First Lieut. Marvin L. Nelson, R. F. D. No. 1,